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**NON-INDUSTRIAL PRIVATE FOREST LANDOWNERS AND US HOME
CENTER RETAILERS' ATTITUDES AND PERCEPTIONS OF FOREST
CERTIFICATION**

A Thesis
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for degree of
Master of Science

In

The School of Renewable Natural Resources

By
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B.Sc, University of Sri Jayewardenepura, Sri Lanka, 2004
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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
LIST OF TABLES	vi
LIST OF FIGURES	vii
ABSTRACT	ix
CHAPTER 1: PROBLEM STATEMENT AND STUDY OBJECTIVES	1
1.1 Problem Statement	1
1.2 Study Objectives	4
1.3 Literature Cited	4
CHAPTER 2: RESEARCH OVERVIEW: A HISTORY OF FOREST CERTIFICATION	6
2.1 Introduction	6
2.2 The Emergence of Forest Certification	7
2.3 The Certification Process	9
2.4 Main Certification Programs	10
2.4.1 Forest Stewardship Council (FSC)	11
2.4.2 Program for the Endorsement of Forest Certification (PEFC)	12
2.4.3 International Organization for Standardization (ISO)	14
2.4.4 Sustainable Forestry Initiative (SFI)	14
2.5 Other Leading Regional and National Certification Programs	15
2.5.1 Canadian Standards Association (CSA)	15
2.5.2 Keurhout Foundation	16
2.5.3 American Tree Farm System (ATFS)	16
2.5.4 Green Tag Certification	16
2.5.5 Other Regional/National Systems	17
2.6 Emerging Issues and Trends in Certification	18
2.6.1 Slow Progress of Certification in Developing Countries	19
2.6.2 Markets for Certified Products	20
2.6.3 Cost of Certification	21
2.6.4 Issue of Private Non-Industrial Forests	21
2.7 Increase of Certification Schemes and Credibility	22
2.8 Summary	23
2.9 Literature Cited	23
CHAPTER 3: AN OVERVIEW OF SOUTHERN NON-INDUSTRIAL PRIVATE FOREST LANDOWNERS AND U.S. HOME CENTERS	26
3.1 Introduction	26
3.2 The Southern Forests	26
3.3 Southern Forestland Ownership	29
3.4 NIPF Landowner Characteristics	32

3.5 Southern NIPF Landowners and Sustainable Forestry	33
3.5.1 Forest Management in NIPF Lands.....	33
3.5.2 Forest Certification Issues	34
3.6 Trends in U.S. Wood Based Industries	35
3.7 Leading Wood Products Retailers	38
3.8 Leading Wood Products Retailers' Repose to Certification	39
3.9 Summary	40
3.10 Literature Cited	42
 CHAPTER 4: LOUISIANA AND MISSISSIPPI NON-INDUSTRIAL PRIVATE FOREST LANDOWNERS PERSPECTIVE OF FOREST CERTIFICATION	 45
4.1 Introduction.....	45
4.2 Methodology	49
4.2.1 Data Handling and Analysis.....	50
4.3 Results.....	51
4.3.1 Response Rate and Respondent Demographics	51
4.3.2 General Profile	53
4.3.3 Ownership and Management.....	54
4.3.4 The Need and Impetus for Certification.....	56
4.3.5 Understanding and Knowledge of General Certification Issues	57
4.3.6 General Attitudes of NIPF Landowners on Certification.....	59
4.3.7 Level of Trust to Administer Forest Certification.....	60
4.3.8 Landowner Willingness to Pay for the Costs of Certification.....	61
4.3.9 Cluster Analysis	62
4.4 Discussion and Conclusions	69
4.5 Literature Cited	72
 CHAPTER 5: U.S. HOME CENTER RETAILER ATTITUDES, PERCEPTIONS, AND BEHAVIORS REGARDING FOREST CERTIFICATION	 74
5.1 Introduction.....	74
5.2 Methodology	77
5.2.1 Data Handling and Analysis.....	78
5.3 Results.....	79
5.3.1 General Profile	79
5.3.2 Underlying Factors of Criteria Used in Selecting Wood Product Suppliers	84
5.3.3 Homecenter Retailers and Certification	87
5.4 Discussion and Conclusions	92
5.5 Literature Cited	93
 CHAPTER 6: GENERAL DISCUSSION AND CONCLUSIONS	 95
6.1 NIPF Landowners, Home Center Retailers and Certification	95
6.2 Implications.....	97
6.3 Limitations of the Study and Lines of Future Research	98
6.4 Literature Cited	99
 APPENDIX A: LOUISIANA AND MISSISSIPPI NIPF LANDOWNER SURVEY	 100

APPENDIX B: HOME CENTER RETAILERS SURVEY	107
VITA.....	113

LIST OF TABLES

Table 3.1: Timberland Area in the U.S. by Ownership Group, 2002	30
Table 3.2: Size Distribution of Forestland Holdings in the U.S. South, 2003	31
Table 4.1: Landowner's Understanding and Knowledge of General Certification Issues	58
Table 4.2: Interaction with Forestry Professionals and NIPFLandowner Understanding of Certification Concepts	59
Table 4.3: General Attitudes of NIPF Landowners on Certification	60
Table 4.4: Final Cluster Centers for Certification Related Questions	64
Table 4.5: Distance between Final Cluster Centers	65
Table 4.6: Landowners Segment Demographic Pprofiles	67
Table 4.7: Comparison of Clusters; ANOVA for Demographic Variables	67
Table 4.8: Post Hoc Tukey HSD Test Results for Significance	68
Table 5.1: Total Variance Explained by Common Factors Components	85
Table 5.2: Factor Analysis of Supplier Selection Criteria	86
Table 5.3: Variation of Criteria Used in Selecting Wood Product Suppliers (ANOVA results).....	91

LIST OF FIGURES

Figure 2.1: Percentage of Certified Forests Endorsed by FSC in each Region	12
Figure 2.2: Progress of PEFC Certification	13
Figure 2.3: Certified Forests in the World by Region	19
Figure 2.4: Trends in Certified Forests Area by Region, 1990-2005	20
Figure 3.1: Forest Resource Reporting Regions of the United States	27
Figure 3.2: Composition of Private Timberland Ownership in Southern U.S.....	30
Figure 3.3: Home Improvement Sales in the U.S., 1999-2005.....	36
Figure 3.4: Channels of Distribution for Residential Furniture.....	37
Figure 4.1: Top 15 Parishes in Louisiana where Highest Number of NIPF Landowners Responded for the Survey	52
Figure 4.2: Top 15 Counties in Mississippi where Highest Number of NIPF Landowners Responded	53
Figure 4.3: NIPF Lands and Ownership by Acreage.....	54
Figure 4.4: Main Reasons for Owning Forest Lands by NIPF landowners.....	55
Figure 4.5: Landowner Perceptions on Need for Forest Certification.....	56
Figure 4.6: Primary Motivation for Forest Certification in the United States.....	57
Figure 4.7: Level of Trust to Administer Forest Certification.....	61
Figure 4.8: Respondent Willingness to Pay per Acre for the Costs of Certification.....	62
Figure 5.1: Distribution of Respondent Corporate Locations.....	79
Figure 5.2: Wood Products Sold by Respondents	80
Figure 5.3: Percent of Sales Attributed to Wood Products.....	81
Figure 5.4: Main Purchasing Channels for Wood Products	82
Figure 5.5: Origin of Wood Products Sold by Leading Home Center Retailers	82

Figure 5.6: Criteria Used in Selecting Wood Product Suppliers by Home Center Retailers	83
Figure 5.7: Reasons for Entering the Certified Wood Products Market.....	88
Figure 5.8: Home Center Retailer Acceptance for Different Certification Schemes	88
Figure 5.9: Premiums Paid for Certified Wood Products Relative to Non-certified Products	89
Figure 5.10: Past (5-year) and Expected Future (5-year) Changes in Sales Volume for Certified Products	90

ABSTRACT

The concept of forest certification, a relatively recent development in forestry, is based on the use of market-based incentives to encourage sustainable forest management practices. Since the majority of forests in US South are privately owned, certifying forests owned by non-industrial private forest (NIPF) landowners is an important issue. From the demand perspective of certification, pressure from non-governmental environmental organizations and consumer awareness has prompted major wood products retailers to state preferences for certified wood products. In the US, wood product demand in the retail home centers sector is second only to the home building industry. In addition, home center retailers have been shown to be a primary driver of forest and wood products certification. In order to ascertain NIPF landowner and leading home center retailer perceptions of forest certification, two mail surveys were conducted. We surveyed 1,200 randomly selected NIPF landowners each in Louisiana and Mississippi, and the top 500 home retail centers in the United States.

Results of the landowner survey indicate that a significant proportion of respondents believe certification could benefit NIPF landowners. Results suggest that many of the negative or neutral attitudes NIPFs hold towards certification are partially due to a lack of information and knowledge on the subject. Many respondents are skeptical of the public's willingness to support certification. However, they believe that certification can contribute to improving the forestry profession and forest management. It was also evident that the cost of certification will continue to be a main certification issue with over three-quarters of respondents being unwilling to pay anything for certification.

Results from the home center study frame certification-related issues from the perspective of wood products retailers looking for the best way to market their products. Only a

few leading wood products retailer respondents are currently participating in certification. Product quality, fair prices and supply issues are regarded as main concerns rather than safeguarding against environmental retaliation in order to be successful. Results indicate that, in general, price premiums for certified products are rare. However, niche markets exist that offer higher prices for certified products. Forest Stewardship Council (FSC) and Sustainable Forest Initiative (SFI) certification schemes are most preferred and accepted by retailer respondents. None of the respondent companies experienced any unexpected costs due to certification.

CHAPTER 1

PROBLEM STATEMENT AND STUDY OBJECTIVES

1. 1 Problem Statement

The United States is one of the leading producers and consumers of industrial round wood in the world (UN-FAO, 2001). Of the approximately 504 million acres of forestlands nationwide, the South¹ accounts for 40 percent of the total i.e. 203 million acres (USDA Forest Service, 2004). About 23 percent of the country's softwoods and 44 percent of the hardwoods are grown in the South that accounts for 55 percent of the total U.S. annual round wood harvest (Prestemon and Abt, 2002).

Non-industrial private forest (NIPF) landowners are defined as private forest owners who do not own or operate wood processing facilities, and include farmers, miscellaneous individuals and non-forest industry operations (Bliss et al., 1997). Southern forests are predominantly owned by non-industrial private forest landowners where 4.9 million landowners owning 71% of the forestlands in the south (Birch 1997; Conner and Hartsell, 2002). Non-industrial private forestlands play a key role in the economies of Southern states (Hubbard, 1999). NIPF landowner management decisions often have a substantial impact on the sustainability of timber production, forest conditions, and state as well as local economies. Hence, the behavior of these landowners has been a frequent topic in forest policy and economics research.

Managing southern forestland for timber production is an attractive investment strategy. For instance, Siry (2002) found that the internal rate of return from forestlands in the south central U.S. varied from 9.8 to 13 percent, with higher rates of return associated with more intensive management. This shows the potential of southern forests to contribute more to the

¹ Southern states refers to Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia

wellbeing of household and regional economy. Therefore, if this goal is to be realized, private landowners need to adopt sustainable forestry practices that benefit both current and future generations, and provide access to developing markets.

The concept of forest certification is a relatively recent development in forestry, emerged in early nineties. Certified forests are forests that are grown, managed, and harvested using accepted practices that meet the needs of current and future generations. The concept of forest certification is based on the use of market-based incentives to encourage sustainable forest management practices (Zakreski et al., 2004). In general, a certification scheme consists of two components; forest management certification, and chain of custody (COC) certification which involves monitoring wood products from its origin to the final consumer. At present, there are five leading certification systems operating in the U.S.; Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), International Organization for Standards (ISO) 14000, Tree Farm, and Green Tag.

However, private landowners in general are not as familiar with certification issues as the forest industry, and many PNIF landowners are concerned about costs associated with becoming and remaining certified (Newsom et al., 2003). As a result, they are unsure whether to adopt certification or which certification system is most appropriate for them. Much of the available information on certification targets industrial landowners, state ownerships, or larger non-governmental organizations while NIPF landowners who own majority of the nation's forests have received less attention and hence, are often underrepresented in certification discussions.

On the other hand, from the demand perspective of certified products, evidence suggests that consumer preference for certified products and their understanding on certification concepts

are on the rise as environmental issues continue to take the center stage. For instance, a comparative study by Ozanne and Vlosky (2003) on U.S. consumer perspective on certification shows that overall consumer understanding of the concept of certification has increased. The pressure from non-governmental environmental organizations along with consumer awareness to a lesser extent, have prompted major wood products retailers to obtain certification. Wood products sold through retail home centers seconds only to the home building industry in the U.S. and therefore, home center retailers are the primary driver of certification from the demand side of the equation.

Although the idea of forest certification is to bring better prices for certified products, availability of such price premiums is an issue of continuous debate. Despite this, several major wood products retailers such as Lowe's and Home Depot have already announced their commitment to provide certified forest products to their consumers. However, it is unclear which certification systems will ultimately be accepted by major wood products retailers.

This study was conducted using two mail surveys pertaining to forest certification. The first was a survey of 1,200 randomly selected NIPF landowners each in Louisiana and Mississippi. The second was a survey of the top 500 home retail centers in the U.S. The landowner survey sought to determine how well NIPF landowners understand forest certification as well as the amount of money they may (or may not) be willing to spend to become certified. The home center survey sought to ascertain their perceptions of current and future forest certification trends as well as certification systems deemed acceptable and preferable to them both now and in the future. This perspective is critical so that landowners have access to all possible markets for their forest products. These studies better frame certification-related issues

from the perspectives of both the forest landowner seeking to sell timber and the retailer looking for the best way to market and sell the products that originate from certified forests.

1.2 Study Objectives

Specific research objectives of the NIPF landowners' survey are

1. Determining PNIF landowner familiarity with and knowledge of forest certification.
2. Identifying landowner concerns about participating in certification.

Specific research objectives of the home center retailers' survey are

1. Ascertain perceptions of current and future forest certification trends.
2. Identify which certification systems are deemed acceptable and preferable by home center retailers.

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CHAPTER 2

RESEARCH OVERVIEW: A HISTORY OF FOREST CERTIFICATION

2.1 Introduction

Public concern for the environment has grown remarkably during the last few decades, both in developed and developing countries, and as a result environmental issues are beginning to take more of a center stage in global economic and trade policies. The emergence of “eco-labeling”, a process that attempts to provide an indicator of how well a product is environmentally adapted is a contemporary example of how consumer interests have driven information processes aimed at differentiating the environmental appropriateness of goods and services. Eco-label provides information on environmental characteristics of a product, giving consumers the opportunity to use their purchasing power to promote environmentally friendly products. Relying on this market driven mechanism, the world's first eco-labeling program “German Blue Eco Angel” was created in 1977 (Rametsteiner, 2000). Ever since, eco-labeling has gained momentum giving rise to a number of different eco-labeling schemes operating throughout the world at present.

A fairly recent development in environmental certification has been the emergence of forest certification. This innovative concept with the objective of identifying products from well managed forests came in to forefront following the discussions on sustainable development issues in the United Nations Conference on Environment and Development held in Rio de Janeiro, 1992. At present, there are several leading certification programs in operation. This chapter reviews the history of forest certification, development of different certification schemes, their progress, and current issues associated with certification.

2.2 The Emergence of Forest Certification

Labeling wood products with a mark of quality can be traced back in Europe to the French royal decree of 1637, which stipulated that members of the guild of cabinet makers had to mark the furniture they made (Pradere, 1989). Other forms of labeling wood have emerged in 1990s under forest certification as market based response to address public concerns related to deforestation mainly in the tropics.

Over the years, two main policy approaches have been adopted to protect forest resources, i.e. top down and bottom up approaches. In the top down approach, fundamentals of policies are formulated at higher levels of government, and implemented under the authority of the government. The success of command and control methods heavily depends on strength of the governing body. Bottom-up methods on the other hand rely greatly on participatory approach where the public agrees on the need for, and forms of policies, and implement them by tradition, cooperative agreement or local rule. However, in modern complex societies, common interests binding the members of smaller communities are lacking, which hinders the success of this approach. Past experiences of ineffectiveness and failures of both these approaches have led to the third approach “certification”; one that introduces policy changes through commercial rather than central or local power, and uses market acceptance rather than regulatory compliance as an enforcement mechanism (Naka et al., 2000).

Forest certification is a process which results in a written certification being issued by an independent third party, attesting to the location and management status of a forest which produces timber (Baharuddin and Simula, 1994). It involves assessing the quality of forest management in relation to a set of predetermined principals and criteria. Forest certification also gives consumers a credible guarantee that the product comes from environmentally responsible,

socially beneficial and economically viable sustainably managed forest. In other words, forest certification promotes economical, environmental and social benefits.

Forest certification found its roots in the concerns over rapid tropical deforestation in 1980s and 1990s (Merry and Carter, 1996; Kiekens, 2003). The majority of terrestrial biodiversity is found in forests, and half of it is considered to be located in tropical forests (Alfonso et al., 2001). As the human population increased, the pressure on the earth's tropical forests has also increased. Approximately 17 million hectares of tropical forests were cleared in 1990 at a rate of more than an acre per second (FAO, 1990). The strain on the forest resource comes on two main fronts; commercial use of wood, and deforestation due to land use changes. According to FAO (2000), expansion of agriculture, expansion of ranching, weakness of tenure systems, uncontrolled fires, development of mining sector, construction of dams and irrigation systems, and logging have been identified as primary causes of tropical deforestation. Poor forest management practices also create many threats to biodiversity and environment, and their impacts are diverse and widespread. In this background, stepping up efforts to maintain biodiversity and environmental quality through improved forest management emerged as an important part of an overall strategy (Rametsteiner and Simula, 2003).

With the intention of finding a solution to this growing issue, in 1988, several environmental groups urged the International Tropical Timber Organization (ITTO) to implement a labeling program to identify sustainably produced tropical timber. The proposal was forwarded in a background where a little progress has been made to implement the Tropical Forest Action Plan. Another proposal for a global forest treaty backed by the G-7 countries had to be abandoned months before the Rio Summit due to oppositions by the G-77 developing countries (Kiekens, 2003).

In 1992, a global effort to wrestle environmental and sustainable development issues resulted in the United Nations Conference on Environment and Development, also known as the Earth Summit, held in Rio de Janeiro. Although no legally binding commitments were made, the Agenda 21 Forestry Principles set out an action plan to probe into sustainable forestry issues. While these formal processes of developing criteria for sustainable forest management were in progress, forest certification started to take shape through the Non-Governmental Organization (NGO) channel. This innovative idea was developed during the parallel NGO Rio meetings. The concept was to initiate a system for certifying and labeling forests and forest products. As a result, a voluntary non-profit organization called the Forest Stewardship Council (FSC) was formed in 1993 with the coalition of Worldwide Fund for Nature (WWF), and other leading environmental organizations. Since then, several forest certification organizations have been formed, and at present, there's a growing competition among these certification programs to become the global leader in forest certification. The scope of forest certification was originally focused on tropical forests, but has now broadened to include temperate and boreal forests.

2.3 The Certification Process

Certification is a multi-faceted process involving retailers, consumers, producers, mills, environmental organizations, societies, and certification systems. The ITTO identifies three main requirements in any working certification scheme; 1) standards which are used as a basis in assessment of applicants, 2) a clearly defined certification process and rules regulating the use of certificates and labels, and 3) adequate institutional arrangements with qualified human resources. The certification standards and criteria are set by the certification body. Independent third party auditors accredited by the certification body evaluate the client firm's adherence to the established standards and criteria during the certification process.

Certification schemes can be broadly categorized into two groups i.e. performance based and process based. Performance based standards define specific performance levels for various aspects of forest management. Process based schemes on the other hand provide a systematic approach to develop, implement, monitor, and evaluate environmental policies. However, they do not stipulate performance standards.

A credible certification program should evaluate the integrity of the producer's claim and the authenticity of product origin (Baharuddin, 1995). Credibility is determined by the quality of forest management and chain of custody assessment, the absence of conflicts of interests, acceptability of key elements of certification schemes to all the main stakeholders, and the positive impact of certification in improving forest management (Bass and Simula, 1999). Simula (1997) points out two essential components of any certification scheme; forest management certification, and product certification in order to provide the necessary information to the final consumer. Forest management planning, inventory, silvicultural practices, timber harvesting, forest road construction, and other on-the-ground operations are assessed against predetermined principals and criteria under forest management certification. In addition, socioeconomic and environmental impacts of forestry operations are also evaluated. Product certification includes the tracking of timber from forest to the final consumer through various production phases of the supply chain such as transportation, storage, processing, and distribution. This process is formally also known as the "chain of custody" (COC) certification.

2.4 Main Certification Programs

As the concept of certification began to take momentum, many certification programs have been evolved. Some of these programs are focused on global forestry while there is an increasing trend to develop national and regional certification programs to accommodate specific

local issues. Some of the leading certification programs, their development, and current progress are discussed here.

2.4.1 Forest Stewardship Council (FSC)

The Forest Stewardship Council (FSC) is an independent non-profit organization formed as an effort to establish a global system for certifying that products come from well managed forests. The mission of FSC is to promote environmentally appropriate, socially beneficial, and economically viable management of the world's forests (FSC, 2005).

The history of FSC goes back to 1990 when a group of timber users, traders and representatives of environmental and human-rights organizations met in California, USA to discuss the need for a credible system to identify forest products that comes from sustainably managed forests. In this meeting, the need for an independent global organization to facilitate the process of certification was emphasized. In 1992, Washington D.C., U.S., the interim FSC board of directors was established, and in 1993 the FSC founding assembly took place in Toronto, Canada with 130 participants from 26 countries (FSC, 2004). Since then, FSC has become one of the largest voluntary programs for independent third-party forest certification in the world (Humphries, 1999).

FSC is a two-pronged process including a forestry performance audit, and a chain of custody audit. FSC does not itself certify forests and instead it accredits qualified independent organizations known as certification bodies to carry out on-the-ground inspections and certification. The FSC certification standards are based on ten main principles. Timber comes from sources that meet the FSC standards are eligible to carry the FSC logo which denotes that the product comes from a well managed forests. FSC scheme has also developed a process to monitor certified timber from forests to the consumer. The chain of custody procedure monitors

the wood products through every stage of their transport, conversion and further processing. A separate certificate is issued each time it passes from one production stage to another. A paper trail audit is performed to observe if products can be linked back to their location of origin. If a set percentage of the wood is clearly linked back to a certified forest, a product eco-label is granted (FSC, 2003).

By mid 1998, FSC certified 10 million hectares of forests around the world. At present the total forest area certified to FSC standards is 67,159,644 hectares (FSC, 2005). While most forest certification activities occur in Europe and North America (Figure 2.1), a range of national certification programs that complies with FSC have been developed, or are in development in many countries including Australia, Chile, Brazil, Malaysia, and Africa (Kiekens, 2003).

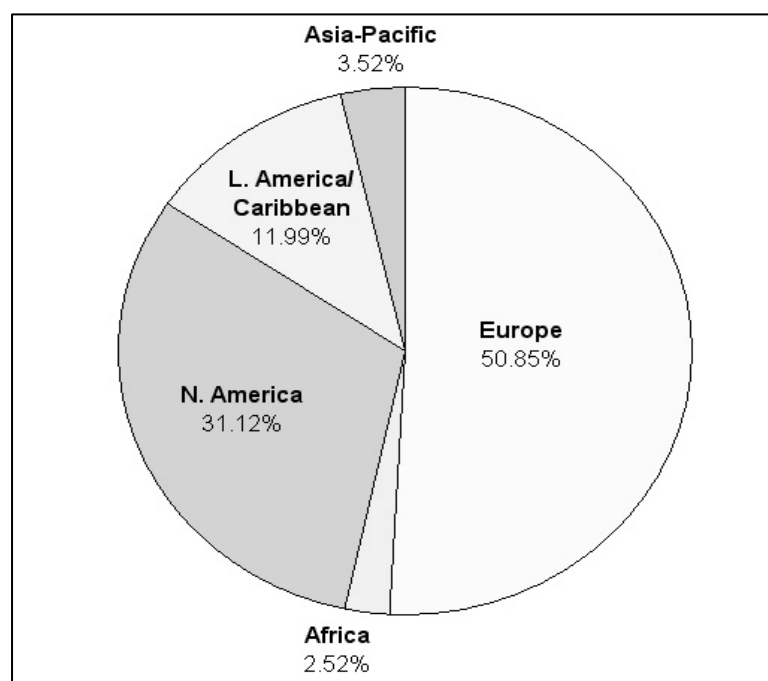


Figure 2.1: Percentage of Certified Forests Endorsed by FSC in each Region
(Source: FSC, 2005)

2.4.2 Program for the Endorsement of Forest Certification (PEFC)

The PEFC was founded on 30th of June, 1999 in Paris with the aim of promoting sustainably managed forests through independent third party certification. PEFC is an umbrella

organization which facilitates mutual recognition among numerous national certification standards developed in a multi-stakeholder process. Although initially developed to address the European situation, the PEFC Council's approach now has worldwide appeal. The unique feature of PEFC scheme is it encourages bottom-up approach to the multi-stakeholder development of certification standards, and respects the use of regional political processes for promoting sustainable forest management as a basis for certification standards (ITTO, 2002). The PEFC is a certifier of certification processes, and it assesses various certification processes against the standards defined by PEFC. Timbers from forests certified under an accredited national process are entitled to carry the PEFC label provided there is a chain of custody procedure in place.

The Finnish Forest Certification scheme, the Living Standards and Norwegian Forest Certification Scheme, and the Swedish PEFC certification scheme are among the first to be endorsed by PEFC in year 2000. At present, 21 national certification schemes have been endorsed by the PEFC Council. Since its establishment, PEFC has gained popularity (Figure 2.2) especially in Europe and so far, there are over 126 million hectares of forests certified under PEFC program (PEFC, 2005).

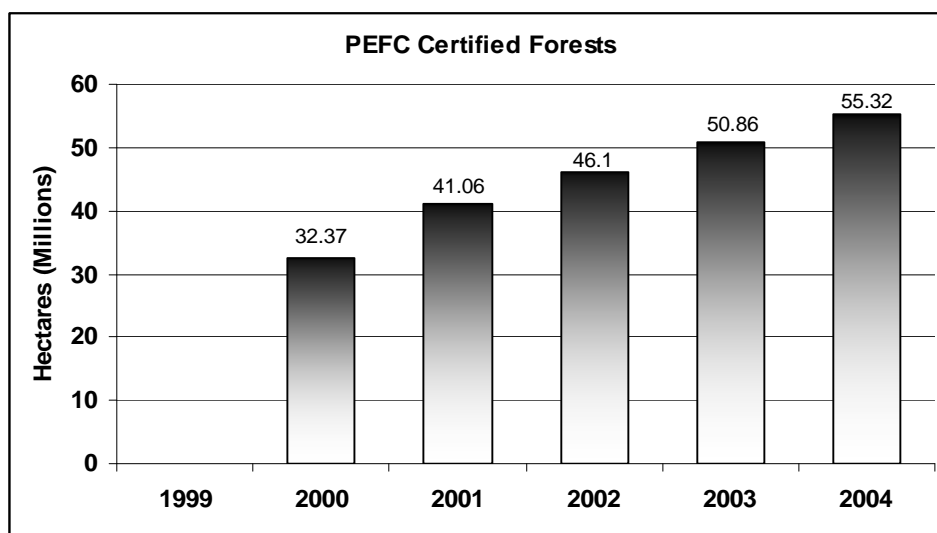


Figure 2.2: Progress of PEFC certification (Source: PEFC, 2005)

2.4.3 International Organization for Standardization (ISO)

The International Organization for Standardization (ISO) is an international non-profit organization that establishes global standards for various products, production processes, and services to ensure that they meet acceptable level of quality. After the Rio Summit, many national standards to ensure environmental safety have emerged which prompted ISO to also develop environmental standards. As a result, the ISO 14000 series of international standards on environmental management were introduced in 1996.

Of all the standards in ISO14000 series, ISO 14001 for Environmental Management Systems (EMS) is the only standard against which, it is currently possible to certify by an external third party certification authority (ISO, 2004). The certification process includes identification of environmental aspects of the operation which pose high risk to the environment, setting objectives and targets to reduce the environmental impacts, identification of changes required to meet the goals and objectives, implementation of new practices and continuous evaluation of their effectiveness. This is more a process based certification system, and is applied at the level of entire enterprise, and it does not include specific on-the-ground standards for forest management, but focused on improved environmental planning. The ISO 14001 system gained wide acceptance around the world largely due to the recognition of ISO, and many companies prefer their forests to be certified under dual certification programs, often one being the ISO standards.

2.4.4 Sustainable Forestry Initiative (SFI)

The Sustainable Forestry Initiative program was established by the American Forest and Paper Association (AF&PA) in 1994 with the intention of promoting sustainable forestry practices in the U.S. It is a comprehensive system of principles, objectives, and performance

measures developed to integrate both responsible environmental practices and sound business practices (SFI, 2001). Compliance with SFI is a condition of membership in the AF&PA. The SFI verification includes both first and second party verification as well as independent third party certification of conformance to SFI standards. The program also has an important education and outreach component geared towards all forest landowners, and requires the public release of an annual progress report. Since its establishment, over 136 million acres of forestland in North America have enrolled in SFI certification program (SFI, 2005).

2.5 Other Leading Regional and National Certification Programs

Certain countries involved in timber trading have found it difficult to comply with certification standards developed by different leading certification programs due to their inappropriateness to the political, cultural, economic, and ecological realities of certain countries or regions. As a result, increasing number of stakeholders in countries around the world has focused on developing their own certification standards based on principles and criteria of well known certification programs. Several leading national and regional certification systems are discussed here.

2.5.1 Canadian Standards Association (CSA)

The Canadian Standards Association (CSA), the official standards setting body for Canada produced a Sustainable Forest Management standard based on a comprehensive set of internationally recognized sustainable forestry criteria in 1996. These standards are consistent with the ISO14001, and also require public participation and audits that verify performance. It covers six criteria (key environmental, economic and social values) and more than 80 indicators associated with sustainable forest management (CSA, 2005). This certification includes both a process (systems) component and performance (on-the -ground) measures. The first certification

under this system was completed in June 1999 and so far, approximately 67.3 million hectares have been certified under CSA standards representing the second largest in Canada (CSA, 2005).

2.5.2 Keurhout Foundation

The Keurhout Foundation with the support of Dutch government in the Netherlands has developed a system and a logo for timber from sustainably managed forests. It also assesses existing certification systems and provides a label for forest products produced from certified forests. The criteria are set by the Dutch government in accordance with other existing schemes such as FSC and ITTO guidelines. At the end of 2003, the foundation ceased to exist but the Keurhout logo and the scheme that had been developed around it was taken over by the Netherlands Timber Trade Association. Currently 39,982,337 hectares of forests have been certified in various countries including Austria, Canada, Finland, Sweden and Gabon (Keurhout, 2005).

2.5.3 American Tree Farm System (ATFS)

The American Tree Farm System (ATFS) can be considered as one of the oldest programs established to promote sustainable forest practices. The system is more oriented for small private landowners. ATFS has established standards and guidelines for property owners to meet to become a certified Tree Farm. The first Tree Farm was designated in Montesano, Washington in 1941, and currently ATFS have 33.2 million acres of privately owned forestlands, and 80,000 family forest owners certified in 46 states of USA (ATFS, 2005). ATFS offers individual third party certification as well as group certification.

2.5.4 Green Tag Certification

The Green Tag certification program in U.S. is specifically designed for private forest landowners. The program was developed by the National Forestry Association in cooperation

with National Woodland Owners Association (NWOA) to promote sustainable forestry practices in private forestlands (NWOA, 2005). Green Tag certification is based on ten guiding principles, and the aim is to provide competent, competitive, and affordable certification for all woodland owners, including those with small acreages. Certified foresters approved by the National Forestry Association conduct the third-party certification. As of November 2006, the Green Tag program had certified 67,692 acres of private forestlands in 12 states (Green Tag, 2006).

2.5.5 Other Regional/National Systems

In addition to these certification schemes, many national and regional certification programs have been developed especially in the tropics, based on ITTO criteria and indicators for the sustainable management of natural tropical forests. ITTO is an intergovernmental organization promoting the conservation and sustainable management, use, and trade of tropical forest resources which includes 59 member countries. It was established under the auspices of the United Nations in 1986. The ITTO first published its criteria and indicators for sustainable forest management in 1992, and these were revised in 1998 and 2005. The purpose of the ITTO criteria is to provide member countries with a tool for monitoring, assessing, and reporting changes and trends in forest conditions, and management systems at the national and forest management unit (FMU) level (ITTO, 2005).

The National Timber Certification Council (MTCC) in Malaysia was established as an independent organization to operate a voluntary national certification scheme in January 1999. The Malaysian criteria, indicators, activities, and standards of performance for forest management certification agreed in 2001 are based on ITTO criteria as well as the other leading certification schemes (MTCC, 2001). To date, nine FMUs covering a total of 4.73million hectares of permanent forest reserves have been certified under MTCC for forest management,

while 55 timber companies have been awarded the MTCC chain of custody certificate, making it one of the most successful national initiatives developed (Buang, 2005). This scheme is recognized by many leading certification programs.

Indonesia also began working on developing an independent third party eco-labeling certification system, and as a result, the Indonesian Eco-labeling Institute (LEI) was established in 1994. It introduced a certification program to implement sustainable forest management in 1998. This system and its criteria and indicators are based on ITTO, FSC, and ISO principles, criteria, and guidelines. LEI certification scheme is also mutually recognized by FSC (ITTO, 2000).

The Brazilian criteria and indicators for natural tropical forest management were developed using the ITTO criteria and indicators for the sustainable management of natural tropical forests, as a framework. The African Timber Organization (ATO) with the assistance of the Center for International Forestry Research (CIFOR) has established the Pan African Forest Certification scheme (PAFC), which confirms to those of the ITTO criteria and indicators.

2.6 Emerging Issues and Trends in Certification

Forest certification has gained wide acceptance ever since its introduction in early 1990s. The concept gained the strong support of many environmental non-government organizations (NGOs), and by 2003 the total forest area certified under any certification scheme reached 117 million hectares (Kiekens, 2003). The certified forest acreage in the world continues to grow. Despite its promising role as a market based mechanism/tool in supporting sustainable forest management, many issues still remain to be addressed if certification is to become a dominant force in the future. Some of the issues and emerging trends in global forest certification are discussed here.

2.6.1 Slow Progress of Certification in Developing Countries

Forest certification was initially introduced to reduce the tropical deforestation. However, vast majority of certifications have occurred in Europe and North America while developing countries where most tropical forests lie, contributed a mere 8% (Figure 2.3) to the total certified forests in 2002 (ITTO, 2002). The overall direct impact of certification on timber producing tropical countries has been very little. Several underling factors have contributed to this situation. Atyi and Simula (2002) identify inflexibility of certification standards, failure to recognize the broader local land-use issues, conflicts and incompatibility between legal settings and certification standards as the key factors for the lack of interest shown by developing countries towards certification. Developing countries are in a different position compared to developed countries with regard to their certification needs and possibilities, and in the resources they have for making use of certification. Tropical timber producers are more concerned about economic aspects of certification such as the expected increase in production costs and uncertainties over market benefits as well as difficulties they face in achieving certification status. For them, certification is more a market requirement imposed by importers which is difficult to comply, and a trade barrio rather than an aid for promoting their exports.

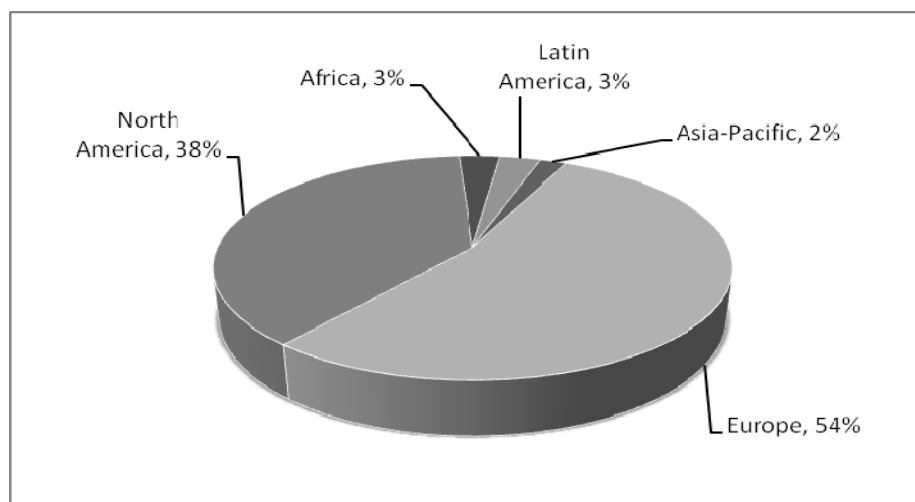


Figure 2.3: Certified Forests in the World by Region (Source: ITTO, 2002)

Latest trends in global forest area show that deforestation rates in developing countries (especially in Africa and South America) still remain high in comparison to developed regions (Figure 2.4) although the rates have been slowed down somewhat (FAO Global Forest Resource Assessment, 2005). This underlines the importance of encouraging and support certification in developing countries in the future.

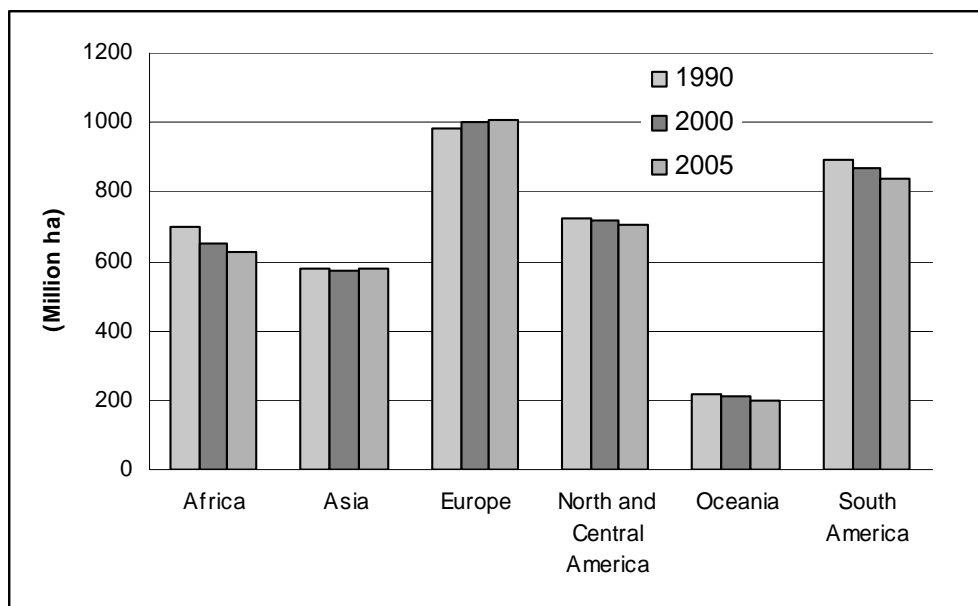


Figure 2.4: Trends in Certified Forests Area by Region, 1990-2005 (Source: FAO, 2005)

2.6.2 Markets for Certified Products

Markets for certified products are strongest in Western Europe and the U.S., and it continues to grow. For instance, Price Waterhouse Coopers predicts an increase in U.S. certified forest products market by 100 to 150% per year (Dixon, 1999). These markets are led by “buyers groups” of forest product retailers and traders, especially retail home improvement chains. Lowe’s and Home Depot in USA, and UK’s B&Q, Homebase, Sainsbury and Meyers (members of “1995+ Group”) are some of the most significant members of such buyers groups. However, in comparison to American and European markets, certification has not gained any meaningful

market share in principal Asian markets such as Japan, Korea and China. These countries are among the leading tropical timber importers (ITTO, 2004).

Although certification relies on a market-driven mechanism with environmentally concerned consumers sending price signals through the supply chain to the forest industry and forest managers, it is unlikely that these consumer price signals will occur in the absence of a real commitment by retailers and traders (Kanowski et al., 1999). Therefore, the role of retailers and traders is likely to play a key role in future development of markets for certified products.

2.6.3 Cost of Certification

There is an additional cost associated with forest certification to include changes to forest management, separate inventories of certified and non-certified products which increase the material handling cost, the costs of tracking certified product through the system to the customer, and the costs associated with becoming and remaining certified. This has sometimes proven to be prohibitively high especially for industries in developing countries and small holders. Certain studies (Gan, 2005) show that certification can increase the production costs by 5 to 25 percent, and as a consequence, negatively affect on world's forestry output creating a hike in global forest products prices. According to Gan (2005), the regions that would suffer most from global certification would not be major timber producing regions, but major net importers of forest products like East Asia. Therefore cost of certification is among the most important issues to be addressed.

2.6.4 Issue of Private Non-Industrial Forests

The majority of certified forests at present are industrial forests and plantations. According to FAO (2005), North and Central America, Europe (other than the Russian Federation), South America and Australia have a significant proportion of privately owned

forests. However, certifying forests owned by private landowners is an issue which has been given less attention by most of the leading forest certification schemes over the years, and as a result, these groups are generally underrepresented in certification. The main concern of private landowners with small acreage is that their needs and circumstances as well as regional variations in sustainable forest management are not easily accommodated in the dominant certification schemes (Kanowski et al., 1999). Some certification programs recently have targeted certifying forests owned by private landowners, and taken measures to assist small landowners in meeting challenges through introducing programs such as group certification in order to cut down the cost of certification.

2.7 Increase of Certification Schemes and Credibility

Since the introduction of the concept of certification, several certification schemes have been formed, and are now in operation. Many have been initiated by forest industries, forest owner groups, and governments who are concerned about conceding too much control of their forests to environmental NGOs through participation in global certification schemes such as FSC. The proliferation of certification schemes has several potential disadvantages.

If an eco-labeling program to be successful, it should hold a dominant position in consumers' mind. With increased number of eco-labels in the market claiming to support sustainable forestry, chances are high that this will lead to confusion in the market. Further more, standards differ greatly between various certification schemes, and this has raised questions over the credibility of many certification schemes. On the other hand, if a certain industry doesn't qualify for certification under a certification scheme which sets higher standards, it can always go for a scheme which is less strict in its criteria and standards.

Since it is not clear which certification schemes would become globally accepted in the future, industrial forest owners and wood base manufacturers also facing a dilemma when it comes to selecting a certification scheme for their industries. Mutual recognition between certification schemes is one way of avoiding these confusions and setbacks.

2.8 Summary

A recent development in environmental certification has been the emergence of “forest certification”. This innovative approach was developed following the discussions on sustainable development issues in the United Nations Conference on Environment and Development held in Rio de Janeiro, 1992. Although the scope of forest certification was originally focused on tropical forests, it has gained rapid momentum, and has now broadened to include temperate and boreal forests. At present, there are several leading certification programs in operation. In addition to global certification schemes, many governments have taken initiatives to develop national and regional certification schemes to facilitate their wood based industries. Despite its vital role as a market based instrument to promote sustainable forestry, certain issues in certification such as finding markets for certified products, low participation of developing countries in certification, the cost of certification, credibility of certification schemes, and certifying small landowners still remain to be addressed.

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CHAPTER 3

AN OVERVIEW OF SOUTHERN NON-INDUSTRIAL PRIVATE FOREST LANDOWNERS AND U.S. HOME CENTERS

3.1 Introduction

The United States currently contains only 6 percent of the world's forest area and 8 percent of the total wood volume, but is the largest producer of industrial round wood in the world (UN-FAO, 2001). Therefore, timberlands are a major land use type in the U.S. According to USDA Forest Service (2004), there are 503.5million acres of timberlands exist nationwide. They offer numerous environmental, economic and social benefits to the landowners as well as to the community. A significant proportion of these timberlands are under Non-Industrial Private Forestland (NIPF) ownership. NIPF landowners are defined as private forest owners who do not own or operate wood processing facilities, and include farmers, miscellaneous individuals and non-forest industry operations (Bliss et al., 1997).

Timbers originating from NIPF lands are a major source of raw material for furniture and other wood products sold through home center retailers nationwide. Wood products manufacturing and home centers make a significant contribution to the country's economy each year. In this literature survey, we discuss the present status of NIPF landowners in the U.S. south with special reference to forest certification. We will further discuss the trends and developments in U.S. wood products and home center retailers sector, and their response to certification.

3.2 The Southern Forests

According to the USDA forest resource reporting regions (Figure 3.1), southern region includes thirteen states; Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia. Out of these,

Alabama, Georgia, North Carolina, South Carolina, and Virginia average approximately 65 percent of total land area in forest. Southern forests are rich in diversity. The temperate climate, abundant rainfall and availing topography in the South have contributed to its diverse forests. Of the estimated 400 plus woody plant species, many have a commercial value (Alabama Forestry Commission, 2006)

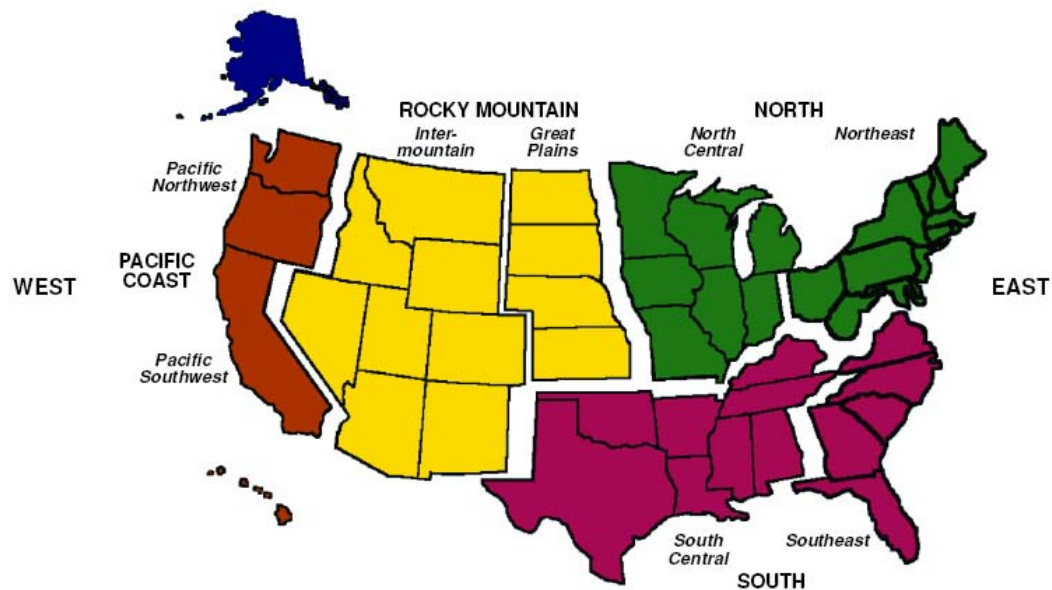


Figure 3.1: Forest Resource Reporting Regions of the United States (Source: USDA, 2004)

Timberlands defined as “forest lands producing or capable of producing in excess of 20 cubic feet per acre per year industrial wood, and not withdrawn from timber utilization by statute or administrative regulations” in the south exceed 202.7 million acres (USDA, 2004). This accounts for approximately 40 percent of the U.S. timberlands. The 202.7 million acres of timberlands in the south are more than any other region. The South grows 23 percent of the nation's softwood timber and 44 percent of the hardwood timber. These timberlands produce about 55 percent of the total U.S annual round wood harvest (Prestemon and Abt, 2002). A recent survey further revealed that southern states also accounted for over half the plywood

round wood, and two-thirds of the pulpwood production of the country (Alabama Forestry Commission, 2006). Southern states also account for approximately 25 percent of the world's pulp and 18 percent of solid wood products (SRS FIA, 2006). Therefore, these highly productive southern forests are often referred to as the “wood basket” of the nation.

Latest USDA Forest Service (2004) survey data indicates that net volume of all growing stock on southern timberlands exceed 267,964 million cubic feet, which is the highest in any region. From this amount, NIPF lands accounts for 189,940 million cubic feet of growing stock where hardwoods making up approximately 64 percent of it. Red and white oaks are the dominant hardwood species while southern yellow pine is the most abundant softwood found in southern forestlands.

Forestry sector often plays a key role in the economies of Southern states, and forest products rank among the top three agricultural crops in all of the thirteen southern states (Hubbard, 1999). For instance in Louisiana, forestry related industries second only to the chemical industry in size. In 1997, the wood products sectors contributed over 770,000 direct jobs to the southern economy, \$120 billion in total industry output, and over \$40 billion in gross regional product (Abt et al., 2002). The total forest industry impact on the state's economy in Mississippi alone was \$14 billion, and accounted for almost 142,000 jobs or 9 percent of all jobs within the state (Measells et al., no date).

In addition to their economic benefits, southern forests provide a variety of ecological and non-use benefits to the society. Ecological functions include soil erosion control, watershed maintenance and protection, providing habitat for wildlife, and conserving biological diversity. Non-use values on the other hand include recreational or aesthetic pursuits such as hiking, fishing, hunting, bird watching etc.

3.3 Southern Forestland Ownership

Ownership is at the center of many current issues surrounding the south's forest lands (Conner and Hartsell, 2003). The management decisions of NIPF landowners has a significant impact on present and future condition of the southern forest based economy including the timber supply as well as the quality of life in rural areas, recreation, and other forest functions.

Seventy one percent of timberland in the U.S. is privately owned. These lands are the main source of timber production and they accounted for 92 percent of growth stock removals in year 2001. Sixty three percent of the volume of growth stock removals came from NIPF lands while the rest came from private industrial forests. Timber harvesting statistics show that timber harvest on NIPF lands has increased by 46 percent in the period of 1986 to 2001, as a large share of harvesting shifted from the Pacific Northwest to the South (USDA, 2004).

Southern forests are predominantly privately owned (Birch, 1997). Of the 202.7 million acres of timberlands in the south, approximately 181 million acres are either owned by forest industry or NIPF landowners i.e. 90 percent of the timberlands are privately owned. The remaining 10 percent is collectively owned by federal, state, and local public owners. Approximately 11.2 million acres are controlled under National Forest system. NIPF landowners account for the greatest share of timberlands with 4.9 million landowners owning 71 percent of the timberlands in the south (Conner and Hartsell, 2003).

Table 3.1 shows a breakdown of southern timberlands by ownership categories, and NIPF landowners dominate the timberland ownership in every southern state. Georgia and Alabama are the leading states in the South that has highest proportions of timberlands and NIPF landowners own approximately 17.6 million acres and 17.9 million acres of the total timberlands respectively. NIPF landowners in Louisiana own about 62 percent of the state's timberlands

while in Mississippi, the proportion exceeds 72 percent. Figure 3.2 further illustrates the composition of private timberland ownership in the south.

Table 3.1: Timberland Area in the US by Ownership Group, 2002

State	Public		Private		Total
	Area ('000 acres)	Percentage	Area ('000 acres)	Percentage	Area ('000 acres)
Alabama	1,226	5.3%	21,696	94.6%	22,923
Arkansas	3,277	17.8%	15,096	82.2%	18,373
Florida	2,817	19.2%	11,819	80.8%	14,636
Georgia	1,757	7.4%	22,045	92.6%	23,802
Kentucky	1,004	8.1%	11,344	91.9%	12,347
Louisiana	1,245	9.1%	12,477	90.9%	13,722
Mississippi	1,935	10.4%	16,636	89.6%	18,572
North Carolina	1,904	10.2%	16,760	89.8%	18,664
Oklahoma	582	9.3%	5,651	90.6%	6,234
South Carolina	1,224	9.9%	11,076	90.0%	12,302
Tennessee	1,565	11.2%	12,390	88.8%	13,956
Texas	783	6.7%	10,990	93.3%	11,774
Virginia	1,906	12.4%	13,465	87.6%	15,371
South Total	21,225	9.9%	181,447	90.1%	202,675

Source: Forest Resources of the U.S. (USDA Forest Service, 2002)

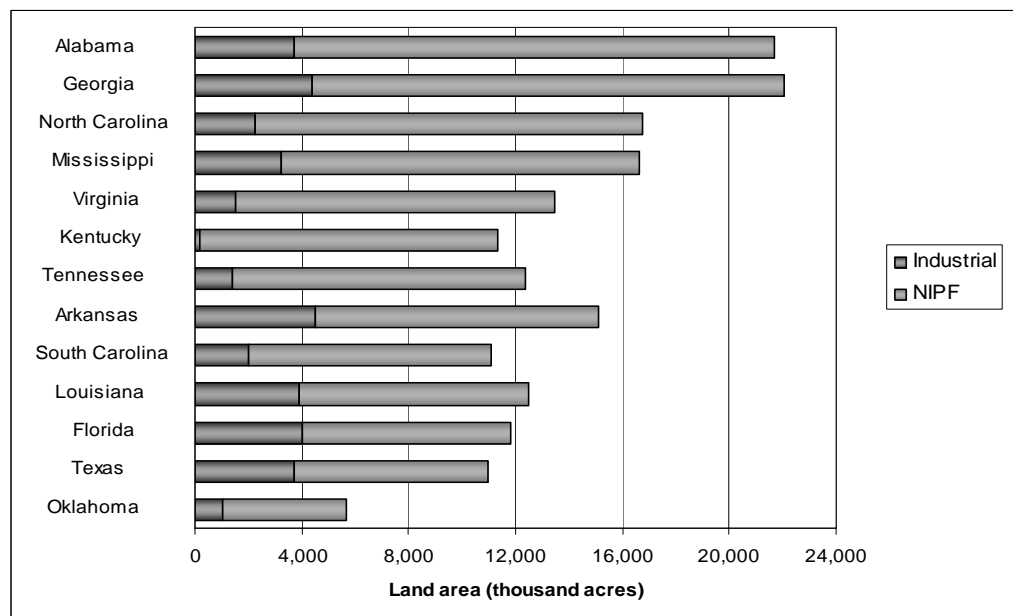


Figure 3.2: Composition of Private Timberland Ownership in Southern U.S. (Source: USDA Forest Service, 2002)

Majority of the 5 million or so private owners of forest lands in the south have small holdings that are less than 100 acres in size. The overall average acreage of a southern private forest ownership is 38 acres. Louisiana has the largest average acreage ownership with 85 acres while North Carolina has the least average acreage of 24 acres (Alabama forestry commission, 2006). A significant proportion of NIPF lands in the south are family owned. Table 2.2 summarizes the size distribution of forestland holdings in the south.

Table 3.2: Size Distribution of Forestland Holdings in the U.S. South, 2003

Size class (acres)	Area (thousands acres)	Number of owners (thousands)
1 - 9	7,255	2,424
10 - 49	26,890	1,338
50 - 99	18,996	288
100 - 499	43,993	243
500 - 999	11,132	18
1000 - 4,999	13,749	8
5000+	5,534	<1

Source: Butler and Leatherberry, (2004)

A noticeable trend in NIPF landownership over the years is the increase of NIPF landowners (Sampson and De Coster, 2000). Trends in NIPF lands since 1982 also indicate an increases in both corporate and individual ownership accompanied by declines in timberland owned by farmers, and recent estimates place farm ownership at just 35 million acres in 12 southern states (Conner and Hartsell, 2002). This annual increase has resulted in greater fragmentation of forestlands. NIPF landowner holdings have declined gradually between the period of 1953 and 2002 from 155 million acres to 145 million acres, and it is likely that the trend will continue (Hodgdon and Tyrrell, 2003). According to the USDA Forest Service (2004), most private landowners in U.S. including the south, own forest lands those are 20 acres or less in size. Fragmentation of forests has several consequences and makes them more difficult to manage on sustainable basis.

3.4 NIPF Landowner Characteristics

Studies indicate that a high proportion of forestland acres in south are owned by retirees who are better educated, generally over 60 years of age, and having higher income in comparison to the general population (Hodge and Southard, 1992; Birch et al., 1998; Vlosky, 2000; Butler and Leatherberry, 2004). Majority of the NIPF landowners are males. The high proportion of older owners has serious implications for land tenure in the future, and much of the forest lands owned by older owners will transfer to their heirs and other parties in the years to come (Birch et al., 1998).

Studies indicate that NIPF landowners in the south own forestlands for a variety of reasons. The values, motivations, and objectives for owning forestland vary widely, reflecting the huge diversity of NIPF owners. For instance, a recent survey on forest landowners in four south-central states revealed that the most frequently cited reason for owning forestland was “as an asset for my children/heirs” (Hughes et al., 2003). These findings are buttressed by the study of Butler and Leatherberry (2004), where southern forest owners ranked “pass land on to their heirs”, enjoyment, and land investment as the most common reasons for owning forest lands.

In their literature survey on family forest owners in U.S., Hodgdon and Tyrrell (2003) identify factors such as aesthetics, recreation, wildlife viewing, and part of residence as most important reasons for owning forestland. Timber production is usually a low priority, although many landowners surveyed in various studies reviewed have harvested timber on their lands. In contrast, a survey on Louisiana NIPF landowners found timber production as the primary reason of owning forestland followed by the desire for a future estate for their families, land investment, and recreation (Vlosky, 2000). In general, small landowners tend to own forestland for amenity values whereas larger landowners place a greater value on timber production.

3.5 Southern NIPF Landowners and Sustainable Forestry

3.5.1 Forest Management in NIPF Lands

Despite the relatively small share of acreage (about 17 percent of the total timberlands), industrial timberlands are typically the most intensively managed, and most readily available source of raw material for the southern timber products industries (Conner and Hartsell, 2003). The relative output is lesser in NIPF lands, and this portraits the difference in management approach between the two private ownership groups.

The most likely factor that affects the decision of NIPF landowners to manage their timberland productively is the acreage of holding. Hodgdon and Tyrrell (2003) in their literature survey highlight the positive correlation between importance of commercial timber production for NIPF landowners and acreage of holding. Landowners who own small to medium-sized timberlands generally lack forestry knowledge and training, thus making their lands less productive, and more often neglected than other ownership categories. This situation is particularly prominent among minorities and females (Hughes et al., 2005). Many studies show that the number of NIPF landowners who have written management plans for their forest lands is very little (Vlosky, 2000; Butler and Leatherberry, 2004). Owners of larger tracts of land are more likely to have written management plans for their forestlands, and seek professional forestry advice or public assistance programs.

Despite the relatively inefficient management status of NIPF forestlands, the thirteen southern states dedicate approximately 60 percent of total U.S. forest industry capital spending (SRS FIA, 2006). Information available on NIPF landowner's investment in management activities is limited. A study on Mississippi NIPF landowners (Arano et al., 2002) showed that 17.4 percent of landowners paying fees for some type of professional service, while 20 percent

of landowners incurred timber management expenditures in any given year. Total expenditures for Mississippi NIPF landowners averaged \$9.68 per acre owned. Study results further indicate many landowners viewed replanting as the most important timber management activity, and this accounts for over half the money they spent on timber management activities. In contrast, timber stand improvement accounts for less than 14 percent of such expenditures (Arano et al., 2002).

Managing southern forestland for timber production is an attractive investment strategy. Siry (2002) found that the internal rate of return from forestland in the south central U.S. varied from 9.8 to 13 percent with higher rates of return associated with more intensive management. Therefore managing NIPF lands on a sustainable basis will have positive impacts for individuals, families, communities, and the region as a whole.

3.5.2 Forest Certification Issues

Over the years, forest certification discussion in the U.S. has been focused predominantly on industrial forests, and other sectors along the chain of custody. The NIPF landowners who own majority of the nation's forests and produce the bulk of annual timber harvest have received less attention, and as a result, these groups are generally underrepresented in certification. The main concern of private forest landowners is that their needs and circumstances as well as regional variations in sustainable forest management are not easily accommodated in the dominant certification schemes (Kanowski et al., 1999). Due to these conflicts of interests, private landowners are discouraged to obtain certification.

For PNIF landowners, the decision whether or not to seek certification is based on a variety of factors including cost to the landowner, perceived benefits such as current or potential access to markets, concerns that the landowners may lose the ability to use their land as they wish, and ease by which the landowner can achieve certification.

Several studies have been carried out in southern states to determine the NIPF landowner perceptions on forest certification. These studies show that the attitudes of NIPF landowners towards certification and sustainable management tend to vary greatly. For instance, in a study of seven mid south states, Bliss et al. (1997) found that a strong support exists for environmental protection among NIPF landowners. This may be attributed to the variety of amenity values landowners derived from their forestlands. However, with regard to forest certification, southern private forest landowners currently have little knowledge on the concept. Most of them remain unsure of the role of forest certification in sustaining the long term health and productivity of their forests. Landowner's knowledge in certification, and adoption of sustainability guidelines are positively correlated to landowner interactions with forestry professionals, and participation in government incentive programs (Vlosky, 2000; Newsom et al., no date).

Cost of certification is usually recognized as the main certification issue. Certification programs are voluntary, and landowners often have to incur the costs associated with modifying and implementing programs to become certified. In general, small landowners face higher per acre costs for forest certification due to the economies of scale. Studies show that majority of the NIPF landowners are not willing to pay the cost of certification (Vlosky, 2000). Some certification programs recently have targeted certifying forests owned by smallholders and taken measures to assist small landowners in meeting challenges through introducing programs such as group certification in order to bring down the certification cost.

3.6 Trends in U.S. Wood Based Industries

Home building, home improvement and remodeling, and furniture industries are among the biggest consumers of wood in U.S. According to the U.S. Census Bureau, the annual new home sales in 2005 was 1,282,000 with an average annual sales price of \$292,200, keeping the

increasing trend in housing expenditure (NAHB, 2006). This can be attributed to strong growth in household income, and wealth which has also given rise to a high-end market.

Since the early 1990s, growth in spending on residential remodeling and repairs has remained steady (Figure 3.3). The estimated total expenditure on residential remodeling by U.S. consumers in 2005 was \$210 billion (JCHS Harvard University, 2005). The National Association of Home Builders predicts that this would increase up to \$238 billion in 2006. Regionally, the south accounts for 31 percent of all remodeling expenditures with an average of \$1513 spent per household in 2004 while the highest spending per household records from Northeast at \$2185 (NAHB, 2006). According to NAHB Economics Department (2006), the local economic impact of remodeling is significant, and it is estimated that for every \$100,000 spent on additions and alterations, the local community receives \$54,200 in income, \$4900 in taxes and other government revenue and full time local jobs.

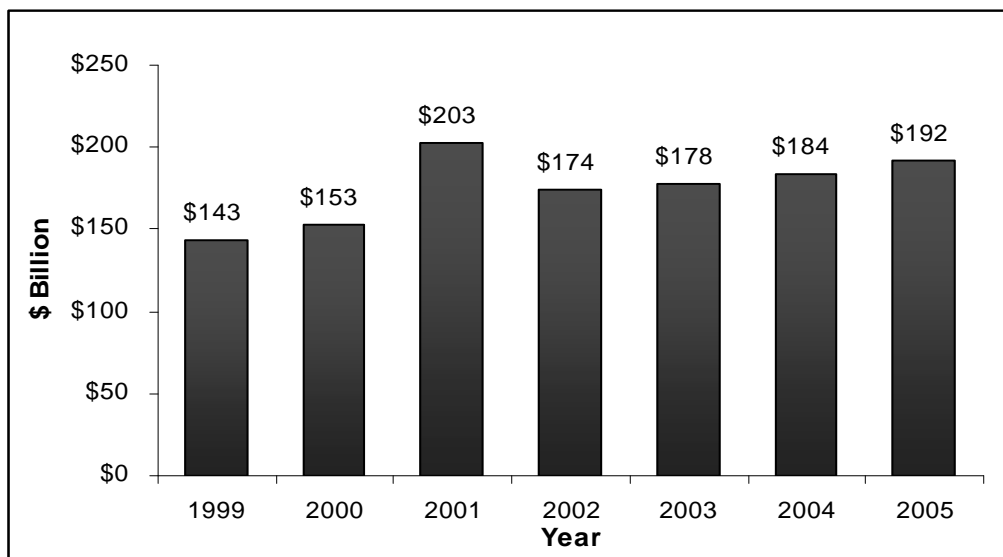


Figure 3.3: Home Improvement Sales in US 1999-2005 (Source: Home channel news, 2006)

Retail expenditure on furniture by U.S. consumers has also shown a gradual increase over the years. However, the domestic furniture industry continues to lose its market share to imports especially from countries like China, Canada, Malaysia and Vietnam (Vlosky,

2005). In year 2004 alone, imports accounted for 54 percent of all wooden household furniture sold to U.S. consumers. The U.S. furniture producers continue to find it increasingly difficult to be profitable when confronted by Asian manufacturers who are producing furniture in factories with low labor costs, and virtually little safety and environmental regulations. Therefore, even with the added expense of overseas transportation and handling, Asian furniture producers have the cost advantage (Luppold, 2003).

Three primary sectors can be identified in US furniture manufacture; integrated manufacturers of either household or office furniture, assemblers of pre-cut wood household or upholstered furniture, and niche producers (U.S. International Trade Commission, 2004). Household furniture go to the final consumer through variety of channels (Figure 3.4) where top hundred furniture retailers channel being the dominant accounting for over 19 percent of the total distribution (Vlosky, 2005).

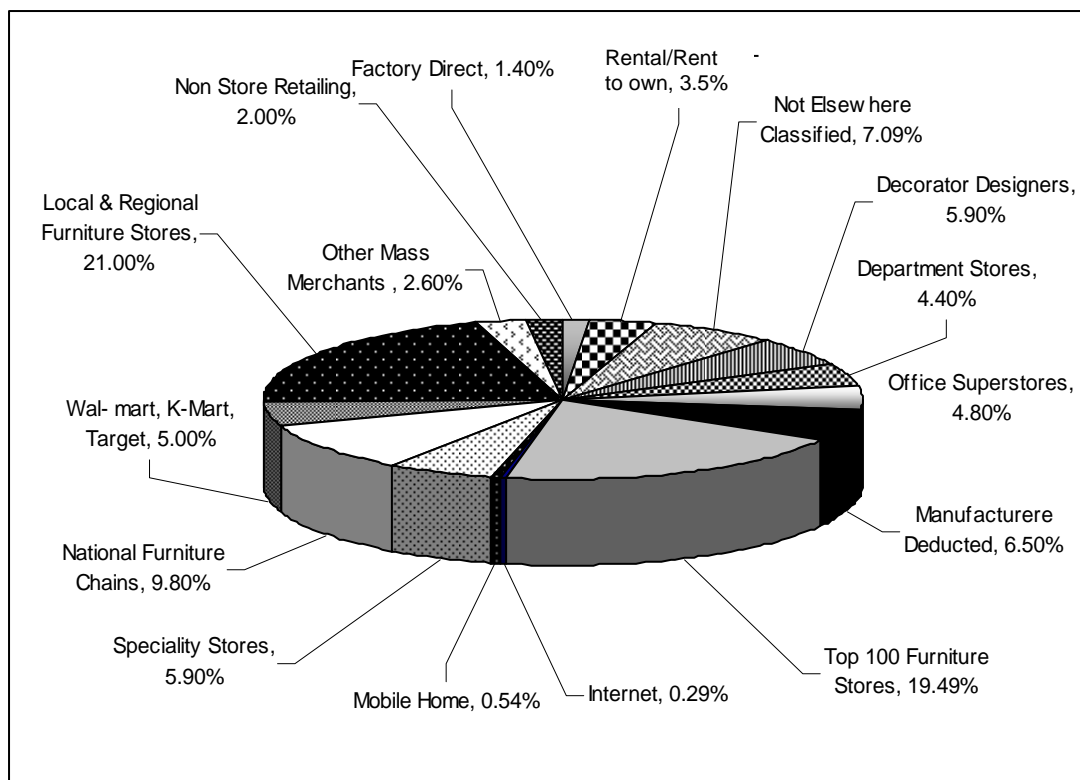


Figure 3.4: Channels of Distribution for Residential Furniture (Source: Vlosky, 2005)

3.7 Leading Wood Products Retailers

Four of the world's top wood buyers; Home Depot, Lowe's, Kimberly-Clark and Procter & Gamble are U.S. based companies, and they operate throughout the country (Rainforests.net, 2006). These companies account for a significant proportion of wood products retail sales each year. In fact, the Home Depot and Lowe's collectively account for over 45 percent of the market share in 2005 (U.S. Department of Commerce in Tratensek and Jensen, 2006).

Home Depot: Home Depot is the world's largest home improvement retailer, and the second largest U.S. retailer. The company mainly operates via retail warehouse stores that sell a wide variety of building materials, home improvement, and lawn/garden products. At present, they are operating more than 2400 stores including stores in Canada and Mexico (Home Depot, 2006). The company employs over 201,000 employees and sales for the year 2005 reached \$81.5 billion (Business week, 2006). Home Depot's chief customer base is the Do-It-Yourself (DIY) customers, who are typically homeowners who complete their own home improvement projects/installations.

Lowe's: Lowe's is the second largest U.S. home improvement chain after Home Depot, mainly catering the DIY and commercial building market. Lowe's has more than 1300 stores in 40 U.S. states (Lowe's, 2006). Among the company's product range that exceeds 40,000 products, lumber and wood products hold a significant position. In fact, lumber comprises nearly one-tenth of Lowe's total annual sales (Rainforests.net, 2006). Their gross sales exceeded \$43 millions in 2005 (Tratensek and Jensen, 2006).

IKEA: IKEA has been ranked as the world's third largest wood consumer. It is one of the world's largest home furnishing retailers with over 220 stores in 24 countries including the U.S. (IKEA, 2006). Timber for their products mainly comes from countries/regions such as

Scandinavia, Eastern Europe and China. According to the Rainforest.net (2006), the company's wood consumption is on the increase at a rate of 15 to 20 percent each year.

Wal-Mart Stores Inc, Home Base, Menards, 84 Lumber, Lanoga, Wickes Lumber, Payless and Cashways are among the other leading home improvement chains while K-Mart, Big Lots, Tuesday Morning, Macy's, Catalog, Aaron Rents, Finger's, Costco, and BJ's, are among the country's other leading furniture and wood products retailers.

3.8 Leading Wood Products Retailers' Repose to Certification

Response to certification by leading wood products retailers can be best explained as "mixed". Demand for certified products mainly comes from large companies who wish to avoid the risk of damaging their brand image. Although it is not yet clear what certification scheme they prefer, a survey of certified forest product retailers in 1998 found that 86% of those surveyed expected an increase in sales volume for certified forest products (Humphries et al., 2000). Certain retailers have responded positively to certification partially due to the pressure from environmental NGOs while some have voluntarily adopted certification.

For instance, Home Depot's commitment to procure certified wood products came after continuous protests of Rainforest Action Network and Earth First environmental organizations. As a result on August 1999, Home Depot agreed to discontinue selling wood originating from endangered forests by the end of 2002 (Krill, 2001). Home Depot's Wood Purchasing Policy states in part that "the Home Depot will give preference to the purchase of wood and wood products originating from certified well managed forests whenever feasible". It also emphasizes the company's commitment to practice, and promote the responsible use of wood products, and support the development and use of alternative environmental products. The Home Depot also became the first home improvement retailer in the U.S. to adopt FSC principles. At present, it is

the largest seller of certified wood products in the U.S. The Home Depot is a member of the Certified Forest Products Council (CFPC); a U.S. based certification organization that partners with FSC and, a member of the Global Forest and Trade Network (GFTN). Taking its commitment to support sustainable forestry practices a step further, the Home Depot foundation awarded a two year grant of \$380,000 to the FSC to develop a global forestry registry known as “FSC Controlled Wood Global Risk Registry” that will help companies to ensure that they purchase wood from well managed forests (NEETF, 2006).

Following the Home Depot’s announcement of its new timber purchasing policy, Lowe's also adopted a wood procurement policy that acknowledges, and prefers timbers originating from well managed forests, in year 2000. Its policy gives preference to procuring wood products from independently certified, well-managed forests. Its wood procurement policy recognizes the Forest Stewardship Council certification system as the one with highest certification standards. Lowe’s is also a member of Certified Forest Products Council (CFPC) and Global Forest and Trade Network (Lowes, 2006).

By the end of 2001, six more of the top 10 retailers in DIY chain; Home Base, Menards, 84 Lumber, Lanoga, Wickes Lumber, and Payless Cashways agreed to implement phase-out programs for wood products originating from endangered forests (Krill, 2001). Following this trend, several companies such as Dell, IKEA, Staples as well as leading home builders Centex Homes and Kaufman & Broad, Ryland Homes have also announced policies to avoid purchasing timber products from endangered forests and unsustainable logging operations.

3.9 Summary

Majority of the forest lands in southern U.S. are under the ownership of NIPF landowners. Therefore, forestry often plays a key role in the economies of southern states.

Southern NIPF landowners own forests for variety of reasons with pass land on to their heirs, enjoyment, and land investment followed by timber production being the mostly sited reasons (Butler and Leatherberry, 2004).

Landowner demographics show that high proportion of forestlands in south are owned by retirees who are better educated, generally over 60 years of age and having higher income (Hodge and Southard, 1992; Birch et al., 1998; Vlosky, 2000; Butler and Leatherberry, 2004). Landowner trends over the past few decades show a gradual increase in the number of landowners owning forestlands, resulting in higher parzalization of forests (Sampson and De Coster, 2000). Louisiana has the largest average acreage with 85 acres, while overall average acreage of a southern private forest ownership being 38 acres (Alabama Forestry Commission, 2006). Timber production is generally associated with larger NIPF forest lands.

Since grater percentage of forests in the south is privately owned, adopting sustainable forestry practices in these lands is critical in terms of economic and environmental point of view. The attitudes of NIPF landowners towards sustainable forest management, and certification tend to vary greatly. With regard to forest certification, southern private forest landowners currently have little knowledge on the concept. Costs associated with becoming and remaining certified, doubts over loosing the sovereignty over their lands remains the most noticeable certification issues. Further more, needs and circumstances of smaller growers as well as regional variations in sustainable forest management are not easily accommodated in the dominant certification schemes (Kanowski et al., 1999).

Housing construction, and repair/remodel applications accounts for the largest timber demand market in the U.S. According to the U.S. Census Bureau, the annual new home sales in 2005 was 1,282,000 with an average annual sales price of \$292,200, keeping the increasing trend

in housing expenditure (NAHB, 2006). Consumer demographics are highly influential in driving wood products market in the U.S. The generation “Baby Boomers” has been the mainstay of the US wood products market for the last few decades. There are 75.8 million Baby Boomers, most reaching their peak spending years and their spending on home improvement projects reached \$72 billion in 2003 (JCHS Harvard University, 2005).

Evidence suggests that the U.S. consumer understanding on concepts of certification and sustainability has increased over the years (Ozanne and Vlosky, 2003). On the other hand there has been a tremendous hype from environmental NGOs which pressurized leading wood products retailers/manufacturers to join certification. As a result, many leading home center retailers such as Home Depot and Lowe’s adopted wood procurement policies to phase-out timbers from unsustainable sources.

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CHAPTER 4

LOUISIANA AND MISSISSIPPI NON-INDUSTRIAL PRIVATE FOREST LANDOWNERS PERSPECTIVE OF FOREST CERTIFICATION

4.1 Introduction

The United States currently contains only 6 percent of the world's forest area and 8 percent of the total wood volume, but is the largest producer of industrial round wood in the world (UN-FAO, 2001). According to USDA Forest Service (2004), there are 504 million acres of timberlands nationwide with the south accounting for approximately 40 percent of the total or 203 million acres. According to Prestemon and Abt (2002), 23 percent of the nation's softwood timber and 44 percent of its hardwood timber is grown in southern region, producing about 55 percent of the total U.S. annual round wood harvest. Timber market models also predict an increase of timber production by about one-third between 1995 and 2040 in U.S. with nearly all of this growth coming from southern forests (Wear and Greis, 2002). As such, highly productive Southern forests are often referred to as the “wood basket” of the nation.

The forestry sector plays a key role in the economies of all of the thirteen southern states (Hubbard, 1999). For instance, in Louisiana, forestry related industries second only to the chemical industry in size. The total forest industry impact on the state's economy in Mississippi state alone was \$14 billion, and accounted for almost 142,000 jobs, or 9 percent of all jobs within the state in 1999 (Measells et al., no date). In addition, forests also provide many amenities to landowners and the public including recreational value, aesthetic enjoyment, wildlife habitats, carbon sequestration, watershed services, groundwater recharge and high quality water.

Southern forests are predominantly owned by Non-Industrial Private Forest (NIPF) landowners, defined as private forest owners who do not own or operate wood processing facilities, and include farmers, miscellaneous individuals and non-forest industry operations

(Bliss et al., 1997). Of the 203 million acres of timberlands in the south, approximately 90 percent (181 million acres) are privately owned either by forest industry or NIPF landowners. The remaining 10 percent is collectively owned by federal, state, and local public entities. NIPF landowners account for the greatest share of timberlands with 4.9 million landowners owning 71 percent of the forestland in the south (Conner and Hartsell, 2003). NIPF landowners in Louisiana own about 62 percent of the state's timberlands while in Mississippi, the proportion exceeds 72 percent (USDA Forest Service, 2004).

Ownership is at the center of many current issues surrounding the south's forests (Conner and Hartsell, 2003). Private landowner management decisions often have a significant impact on the sustainability of timber production, forest conditions, and state and local economies. Hence the behavior of NIPF landowners has been a frequent topic in forest policy and economics research. With regard to changing attitudes on forestlands of Southern landowners over the years, Tarrant and Hull (2004) identifies three major trends; (1) relative decline in utilitarian and economic forest values (2) concomitant increase in non-economic values and attitudes held by the southerners, and (3) continued emphasis on economic values of forests with increasing interest in non-economic attributes of forests.

Studies on southern NIPF landowners show that they own forestlands for a variety of reasons. The values, motivations and objectives for owning forest vary widely, reflecting the huge diversity of NIPF owners. For instance, Hughes et al., (2003) in a study of forest landowners in four south-central states found that the most frequently cited reason for owning forestland was "as an asset for my children/heirs." This finding is supported by Butler and Leatherberry (2004), who found that southern forest owners ranked "pass land on to heirs" as the most common reason for owning forest lands, followed by "enjoyment" and "land investment."

In contrast, a survey of Louisiana NIPF landowners found timber production as the primary reason to own forestland, followed by the desire for a future estate for their families, land investment, and recreation (Vlosky, 2000). A study on NIPF landowners of the Coastal Plain of South Carolina also yielded similar results where they ranked commodity values such as timber and land value over amenity values of forests (Jacobson et al., 1996). Hull and Stewart (2002) attributed the increasing interest of southern landowners in non-economic attributes of forests to the change of ownership where people with more urban and more environmental conservation orientations are becoming the new owners of southern forests. In general, small landowners tend to own forestlands for amenity values whereas larger landowners place a greater value on timber production.

A fairly recent development in the field of forestry has been the emergence of forest certification. It is an assessment of forest management practices and forest management systems in relation to performance indicators of specified social, ecological and economic standards. The overall idea behind certification is to use market-based incentives to encourage sustainable forest management practices (Zakreski et al., 2004). Over the years, forest certification debate in the U.S. has been focused predominantly on industrial forests, and other sectors along the chain of custody from the forest to consumers. NIPF landowner who owns majority of the nation's forests and produce bulk of the annual timber harvest has received less attention, and hence, are often underrepresented in certification discussions. The main concern of NIPF landowners regarding certification is that the needs and circumstances of smaller ownerships as well as regional variations in sustainable forest management are not easily accommodated in leading certification schemes (Kanowski et al., 1999).

For NIPF landowners, the decision whether or not to seek certification is based on a variety of factors including cost to the landowner, perceived benefits (current or potential access to markets), concerns that the landowner may lose the ability to use the land as they wish and ease by which the landowner can achieve certification.

Several studies have been carried out in southern states to determine the NIPF landowner perceptions on forest certification. These studies show that the attitudes of NIPF landowners towards certification and sustainable management tend to vary greatly. This may be attributed to the variety of amenity values landowners derive from their forestlands. For instance, in a study of seven mid-south states, Bliss et al. (1997) found that there is strong support for environmental protection among NIPF landowners. In contrast, a survey of NIPF landowners in Louisiana revealed that majority doesn't believe certification is necessary on private lands (Vlosky, 2000). Support for certification among NIPF landowners tends to come mainly from certain demographic groups who interact with forestry professionals frequently and groups who have experienced participating in Government incentive schemes/outreach programs (Newsom et al., 2003). Fears over losing the sovereign rights to utilize their lands in the way they desire was a major concern among Arkansas NIPF landowners despite their strong support for adopting environmental protection measures on private forestlands (William et al., 1996).

Relative to the forest industry, NIPF landowners generally have little knowledge of the concepts and issues surrounding forest certification (Newsom et al., 2003). Also, many NIPF landowners are concerned about costs associated with becoming and remaining certified. As a result, many NIPF landowners are either unfamiliar with certification or are unsure which certification system might be most appropriate for them. Much of the available information on certification targets industrial landowners (Auld et al., 2003), state ownerships, wood products

manufacturers (Auld et al., 2001), and consumers at the end of supply chain (Vlosky and Ozanne, 1997). Only recently have certification programs targeted NIPF landowners.

The objectives of the study were to

1) Better understanding NIPF landowner familiarity with and knowledge of forest certification and,

2) Identifying landowner concerns about participating in certification.

In order to achieve these objectives, a mail survey was sent to 2,400 randomly selected NIPF landowners in Louisiana and Mississippi in fall, 2005.

4.2 Methodology

A mail survey was the primary research instrument used. A survey was developed for PNIF landowners. The purpose of this survey was to determine NIPF landowner familiarity with and knowledge of forest certification, and to identify other related trends in southern NIPF landownership. This survey addresses research objectives. During the fall of 2005 to spring 2006 period, a mail questionnaire was sent to 2400 randomly selected NIPF landowners in Louisiana and Mississippi, with 1,200 landowners from each state. The study sample was obtained from tax roll information of both states.

The questionnaire contained both scale and fixed response questions. Scale questions were used to measure major concepts. The scales of measurement included nominal, ordinal, and interval. In addition, 5-point scaling questions anchored by 1 = strongly agree to 5 = strongly disagree, and by 1 = very important to 5 = very unimportant, were employed to measure the respondent's level of agreement with various questions addressing certification. The questionnaire also contained fixed response questions and open-ended questions which allow respondents to express their thoughts and ideas not covered in the fixed format questions.

The questionnaire was pre-tested with a sub-set of 20 representatives from the sample and revised accordingly before the final mailing. Mailing procedures followed the Tailored Design Method (Dillman, 2000), and included a pre-notification postcard, the first questionnaire mailing with a postage paid return envelope, a reminder postcard, and a second mailing to first-mailing non-respondents. Cover letters that accompanied the questionnaires were personally signed by the principal investigator to ensure the credibility and confidentiality of respondents.

4.2.1 Data Handling and Analysis

The survey variables were entered into two databases in Microsoft Excel. The first database was used to keep records of returned responses, undeliverable surveys, names and address changes. A second database was maintained to store responses from each respondent in a way to ease the process of further analysis. The statistical analysis of the data was done mainly using SPSS; a statistical package widely used in social sciences studies. The analysis mainly utilized descriptive statistics including simple frequencies and mean responses, correlation tests and t-tests. Cluster analysis techniques and Analysis of Variance (ANOVA) tests were employed to describe NIPF landowner segments which most accommodate certification.

Cluster analysis is an empirical statistical technique that is used to identify homogeneous subgroups of cases in a population (Punj and Stewart, 1983). The subgroups are identified in such a way to both minimize within-group variation and maximize between-group variation. The technique does not provide clear-cut rules in choosing a solution. Therefore, cluster analysis presents a complex challenge, and the analyst has to consider several methodological choices that ultimately determine the quality of a cluster solution (Ketchen and Shook, 1996). It is generally recommended that the choice of a cluster solution should be based on less rigid guidelines and uncomplicated interpretability (Ozane and Vlosky, 2003). Hierarchical clustering

and K-means clustering are the most commonly used clustering techniques. In this study, K-means clustering was used to identify different NIPF landowner segments supporting forest certification.

4.3 Results

4.3.1 Response Rate and Respondent Demographics

Of the 2,400 surveys mailed, 457 were either undeliverable or inappropriate due to respondent being deceased, no longer owning forest lands or their unwillingness to participate in the survey. There were 231 and 226 unusable surveys from Louisiana and Mississippi, respectively. The total number of usable surveys received was 592, for an overall adjusted response rate of 30.5 percent. The total number of usable surveys represents 307 NIPF landowners from Louisiana (adjusted response rate of 31.6 percent) and, 285 NIPF landowners from Mississippi (adjusted response rate of 29.3 percent). Adjusted response rate was calculated as follows.

$$\text{Adjusted Response Rate} = \text{Usable Surveys} / [\text{Total Sample} - (\text{Undeliverables} + \text{Unusables})] \%$$

Counties/parishes where highest number of responses received is illustrated in Figures 4.1 and 4.2 for Louisiana and Mississippi respectively. These are based on mailing addresses and do not represent the location of the property. Two-tailed t-tests were used to identify whether the mean responses of Louisiana and Mississippi landowners differ from each other significantly. There were no statistical differences found between Louisiana and Mississippi respondents for any of the questions asked in the questionnaire at a 0.05 significance level. Accordingly, results are combined for all respondents.

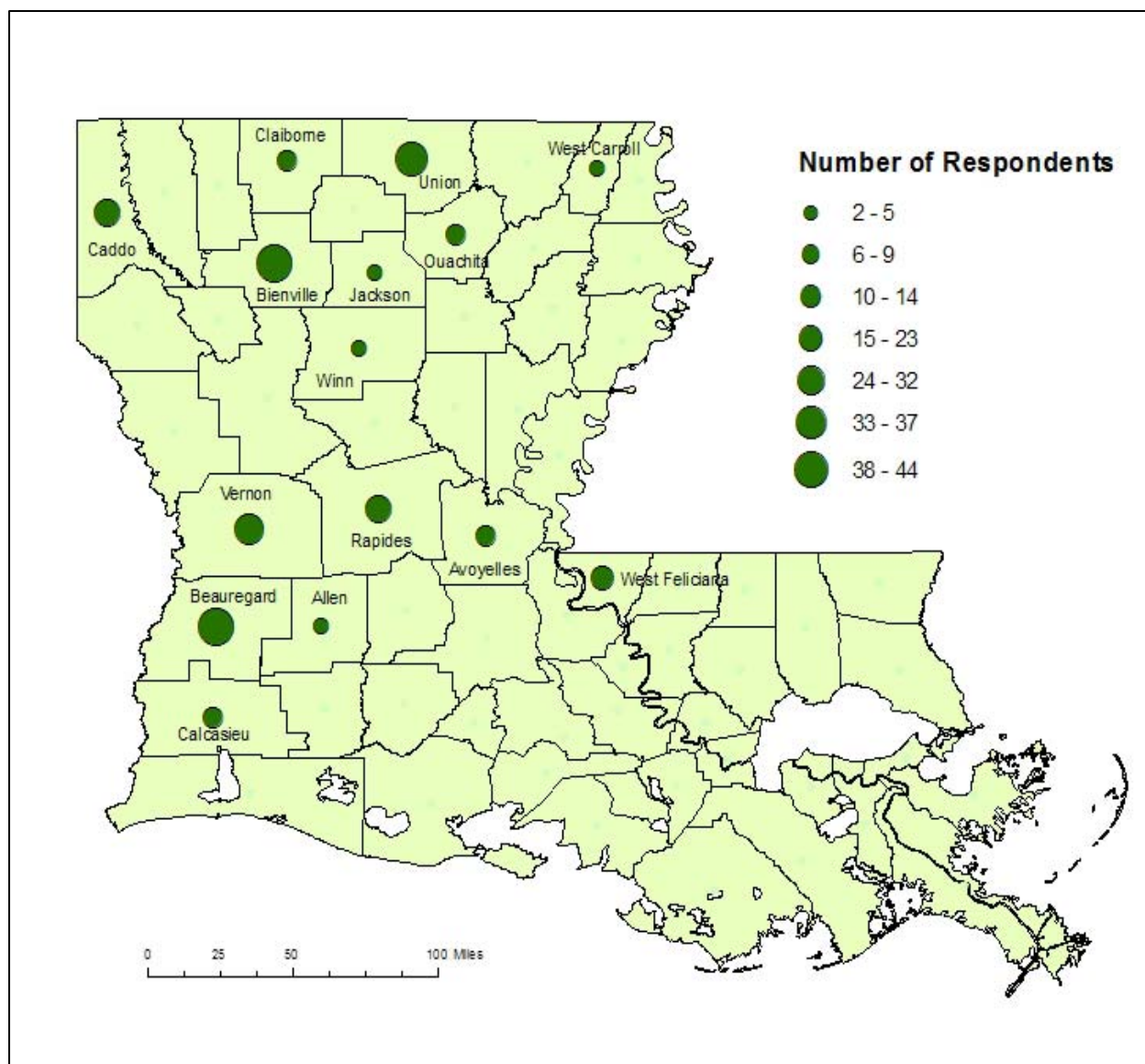


Figure 4.1: Top 15 Parishes in Louisiana where Highest Number of NIPF Landowners Responded for the Survey

Over 76 percent of the respondents were males. Annual 2004 income was less than \$75,000 for 63 percent of respondents, and nearly 53 percent were 65 years or older. Eighty-two percent are married and 56 percent have a college (BS) or advanced degree (MS or PhD). Seventy-six percent of respondents resided in the respective state where they owned forestland and the balance were absentee owners, residing in other U.S. states.

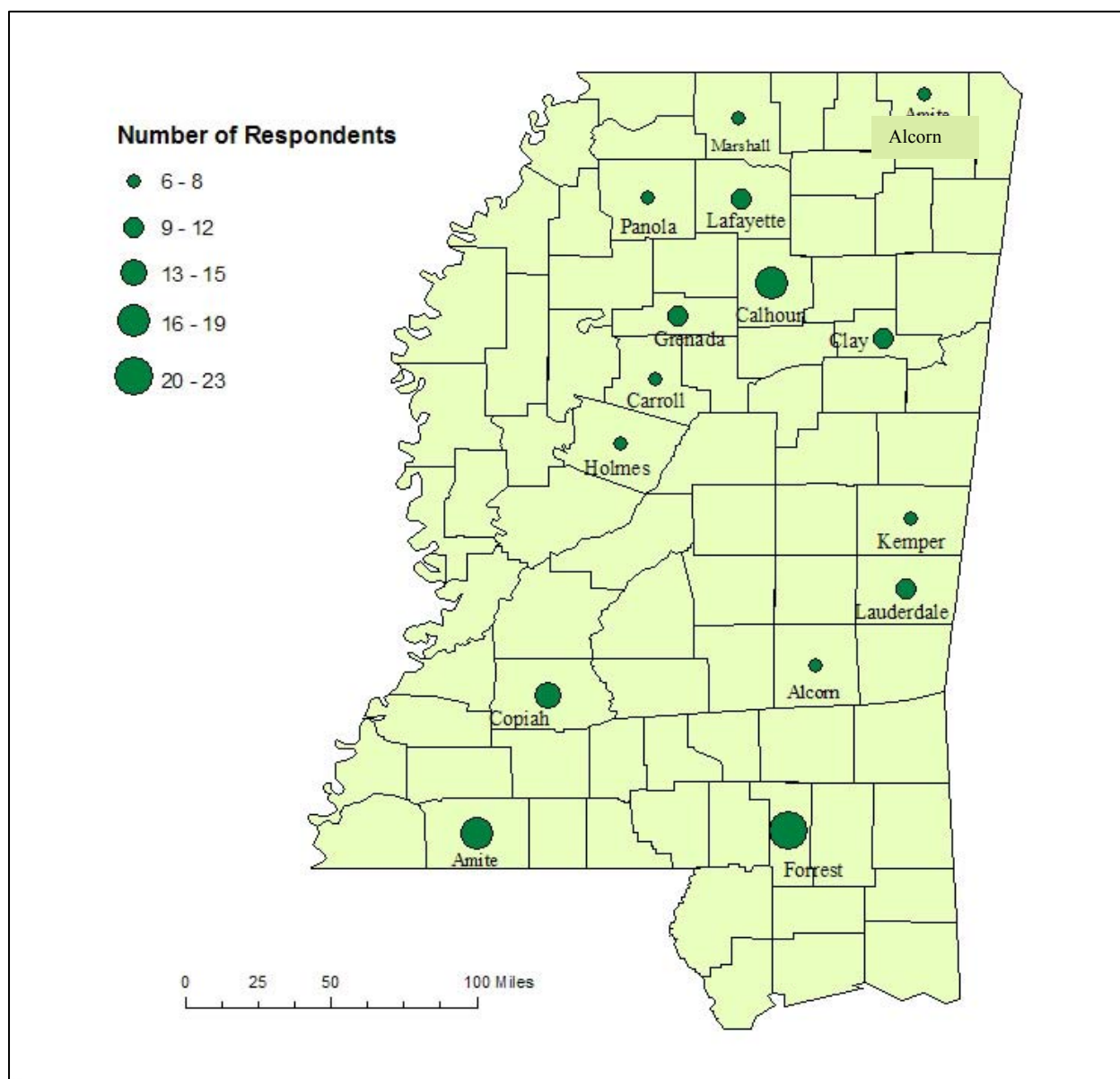


Figure 4.2: Top 15 Counties in Mississippi where Highest Number of NIPF Landowners Responded for the Survey

4.3.2 General Profile

Over the past 10 years, respondents have acquired total forestland area of 180,234 acres while disposing 396,627 acres in the same period. This corresponds to a total acquisition (n=558) of 323 acres, and 707 acres sold (n=561) per respondent. The general tendency of NIPF landowners is to dispose/sell their lands rather than to acquire.

4.3.3 Ownership and Management

Approximately 66 percent of the respondents owned less than 200 acres of land. Only 2 percent owned 5,000 acres or more (Figure 4.3). Eighty two percent of the respondents (n=569) individually owned forestlands. This includes 57 percent of individual or joint spouse ownerships and 25 percent of joint children, siblings and extended family ownerships other than family corporations.

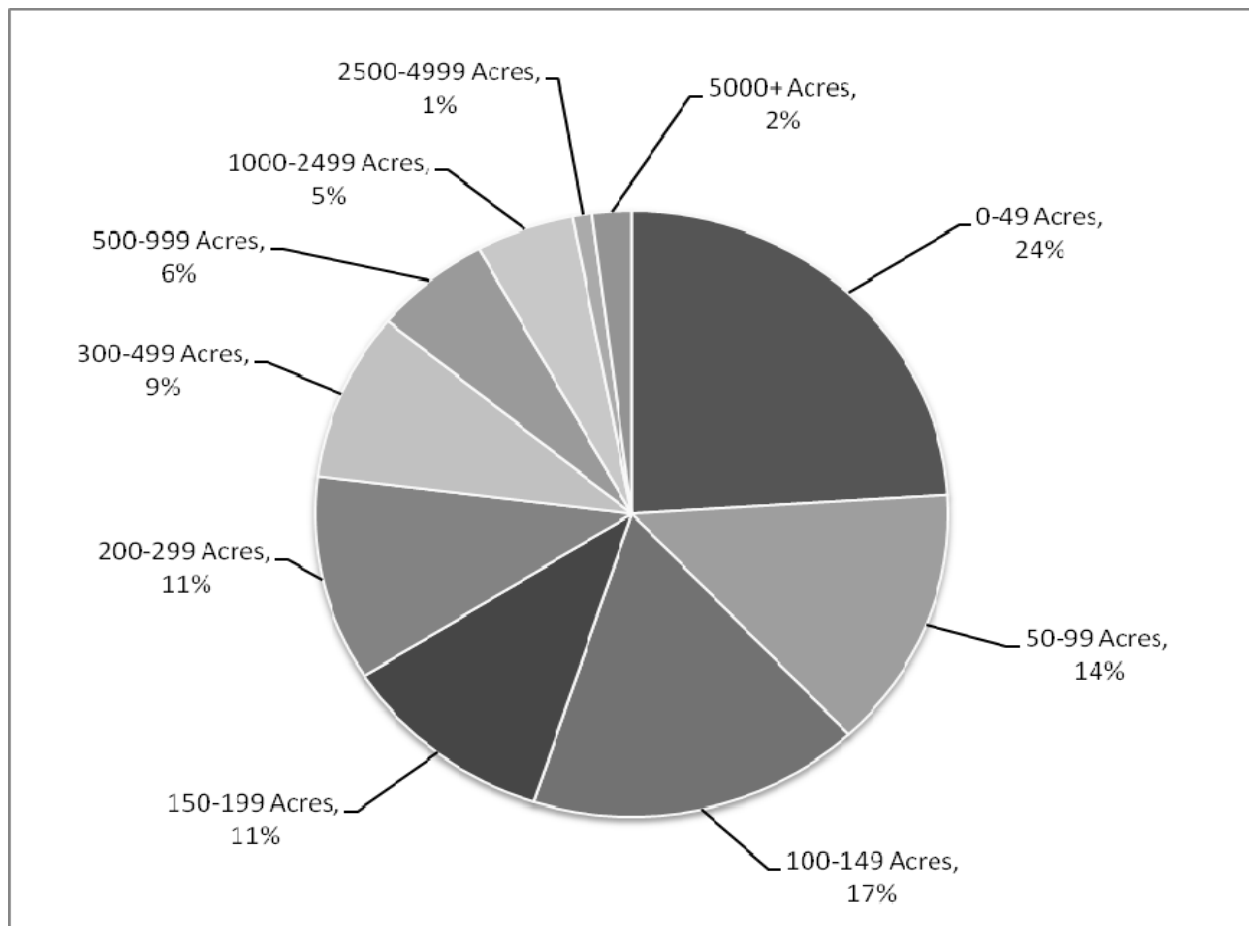


Figure 4.3: NIPF Lands and Ownership by Acreage

About 30 percent of the respondents (n=591) ranked timber production as the most significant reason to own timberlands (Figure 4.4). The second most important reason for NIPF landowners to own forestlands is “as a property to pass on to their heirs”. This was closely followed by recreational purposes, land investment, and to enjoy the privacy that forest lands can

offer. The “other” category mainly included reasons such as “a land/estate inherited from parents” and for mineral and oil rights.

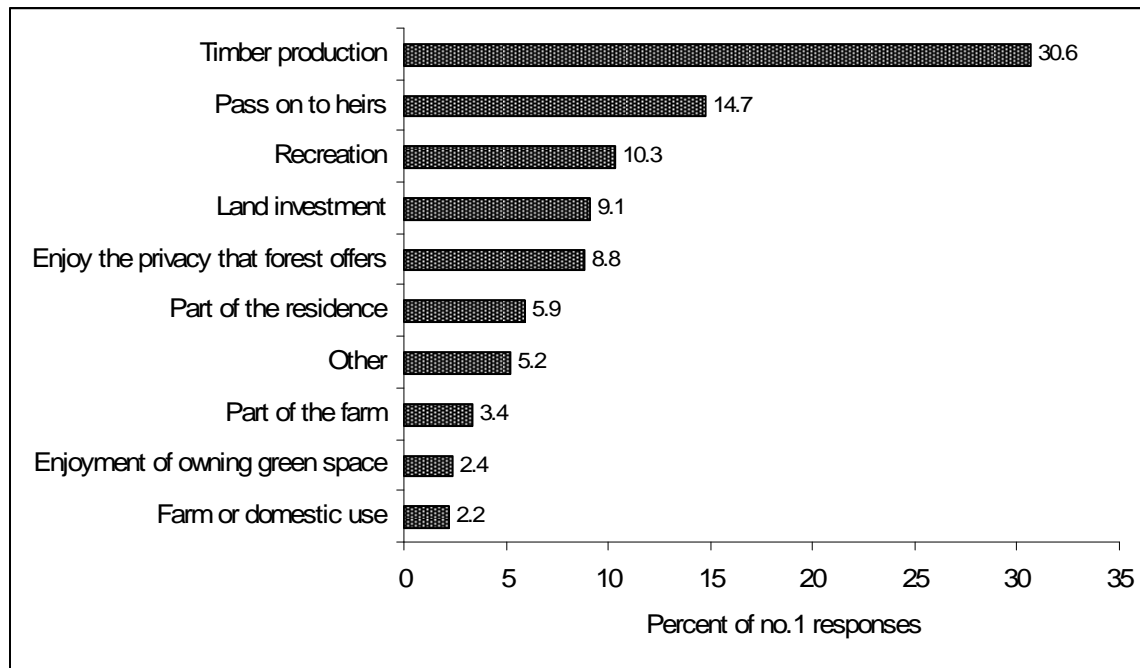


Figure 4.4: Main Reasons for Owning Forest Lands by NIPF Landowners

Eighty percent of the respondents harvested timber products during the time they have owned forestland. Saw-logs was the main product harvested (58 percent) by NIPF landowners from their timberlands followed by pulpwood (48 percent), chip-n-saw (21 percent), and fuel wood (15 percent).

Out of 562 respondents, the majority (73 percent) did not have a written forestry or wildlife management plan for their property while 57 percent have taken some form of advice from a forestry professional in managing their forests. Of the 27 percent of respondents who have management plans, 86 percent said that the management plan was prepared by a forester or other forestry professional while the remaining 14 percent said that they prepared the management plan themselves.

4.3.4 The Need and Impetus for Certification

Respondents were asked about their perceptions of the need for forest certification on forestland by ownerships. Respondents gave top priority to national and state forests followed by tropical forests as forests that need some form of certification (Figure 4.5). About 40 percent of the respondents believe certification is necessary on private lands. However, the landowner's lowest level of agreement is with the need of certification on private forestlands. The level of agreement to the question on the role of forest certification in sustaining health of different forest ownerships also followed more or less the same response pattern. Landowners strongly agreeing with statements of forest certification can help sustaining the health of public forests (score, 4.1 of 5), and state forests (score, 4.1). The least agreement was with private forestlands (score, 3.5).

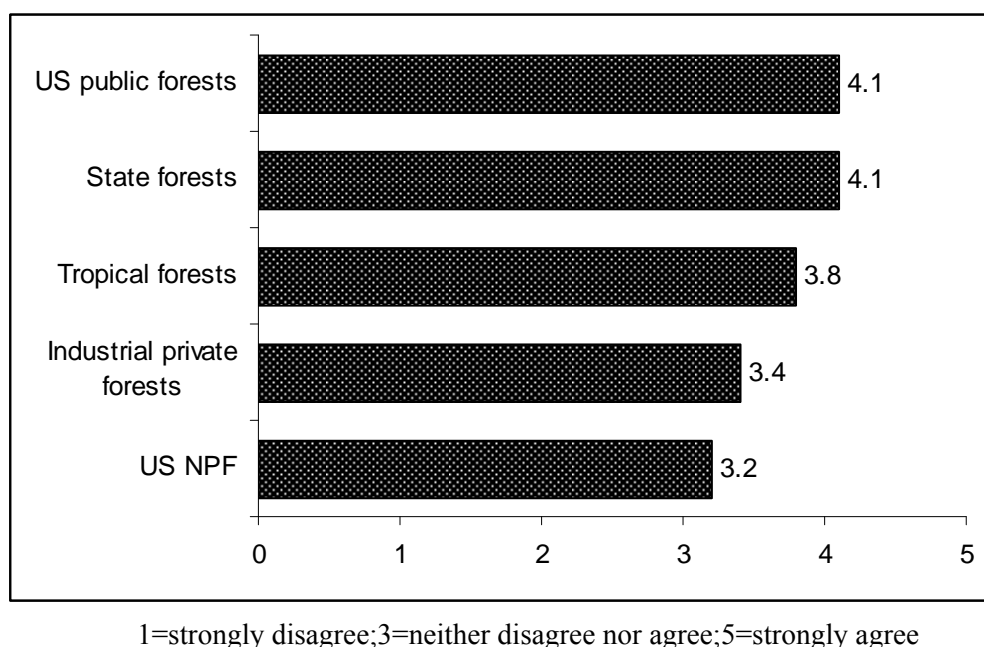
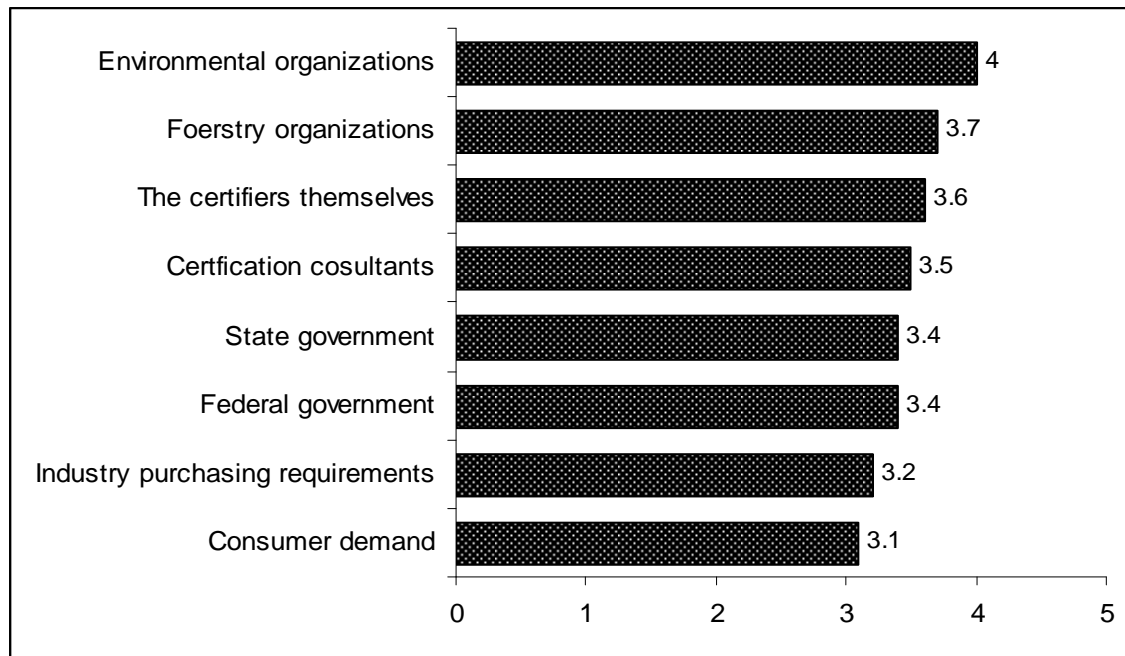


Figure 4.5: Landowner Perceptions on Need for Forest Certification for Different Ownerships

Respondents were also asked to rank their level of agreement regarding the impetus for certification in the U.S. on a 5 point Likert scale (Figure 4.6). Nearly 65 percent of the respondents consider environmental organizations as the main driving force behind certification

in US. This group is closely followed by forestry organizations, certifiers and certification consultants. Only 30 percent believe certification is demand driven which was ranked last.



1=strongly disagree; 3=neither disagree nor agree; 5=strongly agree

Figure 4.6: Primary Motivation for Forest Certification in the United States

4.3.5 Understanding and Knowledge of General Certification Issues

Questions were asked to reveal landowner's knowledge on certification and Table 4.1 summarizes the responses. Forty seven percent of the respondents admitted that they understand the concept of forest certification well or to some degree. More than 56 percent felt certification could improve the forestry profession in the U.S., whereas 37 percent thought consumers are willing to pay price premiums for certified wood products. High number of "neither disagree nor agree" responses to these statements may suggest that respondents are not sure how consumers in the market place would react given the choice between certified products and non-certified products. Such responses to most statements also indicate the little knowledge landowners have of certification.

As stated in the literature review, it is assumed that the understanding of certification concepts is greatly influenced by respondent demographics. Therefore, appropriate statistical tests were performed to investigate these relationships. According to independent sample t-tests, the gender of respondents had no significant influence on their understanding of certification issues at $\alpha = 0.05$ significance level. The education level of respondents was weakly and non-significantly correlated to the understanding of various certification issues/concepts at $\alpha = 0.05$ significance level. Other demographic variables such as age also showed a non-significant correlation with understanding of certification issues at $\alpha = 0.05$ significance level. However, the income level showed a rather weak, but significant correlation with ‘adoption of sustainable practices on their lands’ (Spearman $R = 0.123$, $p=0.013$), belief of consumers paying a premium for certified products (Spearman $R = -0.184$, $p=0.00$) and trust of environmental claims made by wood product suppliers (Spearman $R = 0.115$, $p=0.02$) at $\alpha = 0.05$ significance level.

Table 4.1: Landowner Understanding and Knowledge of General Certification Issues

	Strongly Disagree	Somewhat Disagree	Neither Disagree Nor Agree	Somewhat Agree	Strongly Agree
I understand the concept of forest certification	8%	8%	36%	27%	20%
I believe forest certification can reduce tropical deforestation	7%	6%	40%	26%	21%
I trust environmental claims made by wood product suppliers	17%	19%	47%	12%	5%
I believe forest certification can improve the forestry profession in the United States	9%	50%	30%	30 %	26%
I believe consumers will pay a premium for certified wood products	15%	12%	36%	21%	16%
I have adopted forest “sustainability practices on my forestland	8 %	7%	35%	23%	27%

Since the assumption of normality was met, independent sample t-tests were employed to examine whether the understanding of certification concepts seem to be influenced by previous interactions with forestry professionals/organizations, and getting advice from them for forest land management activities (Table 4.2).

Table 4.2: Interaction with Forestry Professionals and NIPF Landowner Understanding of Certification Concepts

Certification issue	Mean response		Significance (at $\alpha=0.05$)*
	Seek advice before	Did not seek advice before	
I understand the concept of forest certification.	3.54	3.26	p=0.004*
I believe forest certification can reduce tropical deforestation.	3.53	3.45	p=0.099
I trust environmental claims made by wood product suppliers.	2.77	2.66	p=0.270
I believe forest certification can improve the forestry profession in the United States	3.63	3.60	p=0.778
I believe consumers will pay a premium for certified wood products.	3.00	3.30	p=0.007*
I have adopted forest “sustainability practices on my forestland.	3.89	3.10	p=0.000*

4.3.6 General Attitudes of NIPF Landowners on Certification

Only 18 percent of the respondents viewed certification as an unworkable concept at present. Considerable proportion (45 percent) of respondents believes forest certification will add an unnecessary level of regulation on private lands. When asked whether the federal or state laws make certification unnecessary, majority indicated a neutral response.

Table 4.3 summarizes additional responses of NIPF landowners regarding attitudes about certification. According to the results, over 40 percent have a somewhat positive perception of forest certification and believe that it can promote sustainable forestry. However, nearly 50 percent of respondents said they are skeptical of the public willingness to support certification and further elaborated that they believe that consumers are confused by the proliferation of certification programs.

The questionnaire also looked at the desired and actual levels of involvement of the forestry community in the certification process. Mean level of agreement for statements “The forestry community should be involved in the certification discussion” and “The forestry community has been adequately involved in the certification discussion” on a 5 point scale were 3.5 and 3.0 respectively. Two-tailed t-test was used to compare the means. A statistically significant difference between mean responses ($p=0.000$ at $\alpha = 0.05$) suggest that there is a large gap between the need of forestry community to be involved, and the actual level of involvement.

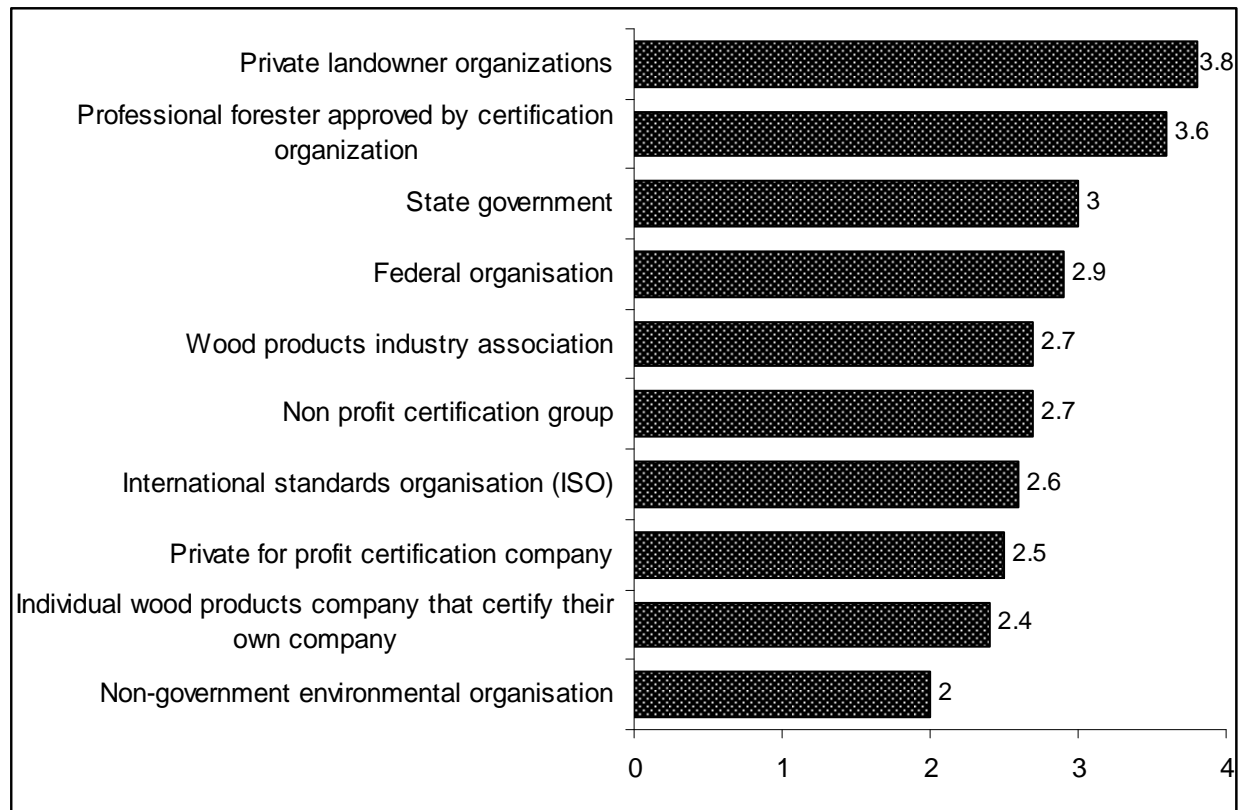
Table 4.3: General Attitudes of NIPF Landowners on Certification

	Strongly Disagree	Somewhat Disagree	Neither Disagree Nor Agree	Somewhat Agree	Strongly Agree
Landowners have been adequately involved in the certification discussion	23%	23%	48%	4.3%	2.0%
The professional forestry community has been adequately involved in the certification discussion	5%	9.4%	65.9%	14.2%	5.2%
Certification programs can provide a vehicle for the forest industry to communicate positive accomplishments to the public	5%	8%	46%	29%	12%
Consumers are confused by the number Of certification organizations that exist	3%	5%	42%	22%	27%
Certification is a potentially viable mechanism to aid in promoting sustainable forestry in the U.S	8%	6%	43%	29%	15%
Certification could reduce the need for additional forest management regulation	10%	10%	49%	22%	9%
The U.S. forestry community should be involved in the certification discussion	8%	4%	36%	28%	24%
I question the willingness of the public to support certification	3%	6%	40%	27%	24%

4.3.7 Level of Trust to Administer Forest Certification

Figure 4.7 indicates the respondent’s level of trust for various entities to implement and monitor certification in the U.S. rated based on a 5 point scale of agreement. Private landowner organizations and approved professional foresters by certification organizations are the most

trusted parties by NIPF landowners to administer forest certification. Interestingly, environmental NGOs which were recognized by respondents as the main driving force for certification were the least trusted entity to administer forest certification.



1=trust least, 3=moderately distrust 5=trust most

Figure 4.7: Level of Trust to Administer Forest Certification

4.3.8 Landowner Willingness to Pay for the Costs of Certification

When asked about NIPF landowner willingness to allow certifiers to freely check their forestry operations (n=554), 28.7 percent were against it. About 46.5 percent has somewhat neutral perception on this regard. This suggests that respondents are generally not averse to having certifiers monitor their forest management activities.

Cost of certification is a concern for NIPF and industrial forest landowners alike. Certification programs are voluntary, and landowners often have to incur the costs associated with modify and implement programs to become certified. Results of the present study show that

majority of respondents (77 percent) are unwilling to bear any cost of certification while 13 percent of the respondents are willing to pay between \$0.5 to 1.00 per acre (Figure 4.8). However, the amount that landowners are willing to pay to become certified showed no statistically significant correlation with their income level (Spearman $R = 0.235$, $p=0.369$ at $\alpha = 0.05$). Since the assumption of normality was not met by the data set in this case, non-parametric Spearman's correlation test was employed.

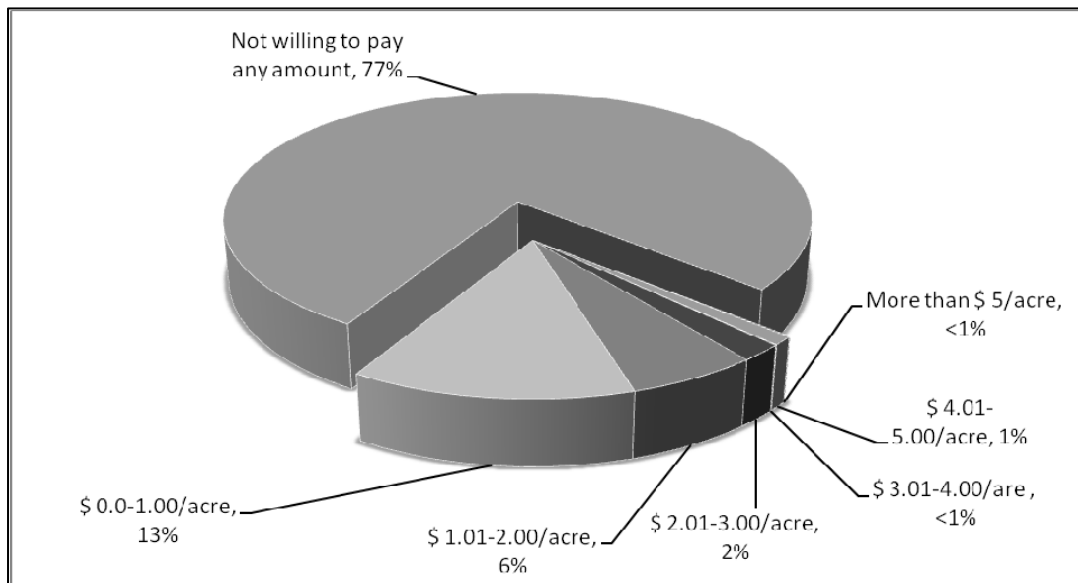


Figure 4.8: Respondent Willingness to Pay per Acre for the Costs of Certification -Percent of Respondents (n=541)

4.3.9 Cluster Analysis

Cluster analysis is a useful empirical statistical technique that can be used to classify objects into homogeneous groups without prior assumptions about the population (Punj and Stewart, 1983). In this study, landowner responses for certification-related questions were classified using K-means clustering technique. K-means cluster analysis group data from larger datasets into a known number of clusters. The number of clusters is user defined, and the procedure assigns cases to clusters. K-means cluster analysis uses Euclidean distance. The technique is particularly useful in marketing research where there's a need to cluster consumers

into homogeneous groups to find comparable segments for test marketing (Ketchen and Shook, 1998).

The quality of a final cluster solution depends on methodological procedures used in identifying clusters. Final clusters should be selected from several possible cluster solutions, and it is generally recommended that the choice of a cluster solution should be based on less rigid guidelines, practicality and uncomplicated interpretability (Ozane and Vlosky, 2003).

In this analysis, three, four, five and six cluster solutions were considered. The five-cluster solution proved to be the one with smallest number of clusters that adequately segmented NIPF landowner responses for certification-related questions. The main objective of the analysis was to identify NIPF landowner segments that accommodate forest certification most so that they can be easily targeted in promotional/extension programs.

Final cluster centers derived from the cluster analysis are illustrated in Table 4.4. Mean scores for all certification-related questions are significant at $\alpha = 0.05$ significance level except for the statement “Consumers are confused by proliferation of certification programs”. All the segments believe that consumers are confused by the proliferation of certification programs ($p=0.074$). Larger f values from NOVA test in Table 4.4 provide the greatest separation between clusters. Responses for questions related to the need for certification and importance of forest certification in sustaining health of different forest types contributed to greatest separation between clusters.

Table 4.5 summarizes the distances between final cluster centers. Cluster 1 largely differ from clusters 3 and 4. Cluster 2 also differ from clusters 3 and 4 to great extent. Clusters 1 and 5 and, 3 and 5 also show high dissimilarities.

Table 4.4: Final Cluster Centers for Certification Related Questions

Certification question	Cluster means					ANOVA F-statistic	Significance <i>p</i> -value
	1 (n=27)	2 (n=28)	3 (n=106)	4 (n=150)	5 (n=136)		
<u>Need for certification of</u>							
U.S. Public forests	1	3	5	5	4	167.664	0.000
State forests	1	3	5	5	4	146.148	0.000
NIP forests	2	1	4	4	3	85.453	0.000
Tropical Forests	2	3	5	4	3	87.944	0.000
US industrial forests	2	1	4	4	3	113.535	0.000
<u>Importance: Forest certification can sustain health of</u>							
U.S. Public forests	1	3	5	5	4	186.177	0.000
State forests	1	3	5	5	4	193.079	0.000
NIP forests	1	2	5	4	3	162.660	0.000
Tropical Forests	2	3	5	5	3	134.039	0.000
US industrial forests	1	2	5	4	3	175.353	0.000
<u>Understanding of certification concepts</u>							
I understand certification concepts	3	3	4	3	3	28.491	0.000
Certification can reduce tropical deforestation	2	2	4	4	3	51.748	0.000
I trust environmental claims made by wood products suppliers	2	2	3	3	3	3.680	0.006
Certification can improve forestry profession in US	2	1	5	4	3	159.877	0.000
Consumers will pay a price premium for certified products	3	2	3	3	3	6.334	0.000
I have adopted sustainable forestry practices on my land	3	4	4	3	3	18.299	0.000
<u>Attitudes towards certification</u>							
US forest laws make certification unnecessary	2	5	2	3	3	64.000	0.000
Forestry laws in my state make certification unnecessary	2	5	2	3	3	65.916	0.000
It is an unworkable concept at present	3	4	2	3	3	70.651	0.000
Certification over-regulate private lands	4	5	2	4	4	45.791	0.000
Landowners are adequately involved in certification	2	2	3	2	2	4.354	0.002
Professional forestry community is adequately involved in certification	3	3	3	3	3	5.113	0.000
Certification helps communicate positive accomplishments to the public	3	2	4	3	3	56.286	0.000
Consumers are confused by proliferation of certification programs	4	4	4	4	4	2.148	0.074
Certification aid in promoting sustainable forestry in the US	3	2	4	4	3	90.486	0.000
Certification reduce the need for additional forest management regulations	3	2	4	3	3	20.459	0.000
US forestry should involve in certification	4	3	4	4	3	19.274	0.000
I question the willingness of the public to support certification	4	4	3	4	4	5.176	0.000

Table 4.5: Distance between Final Cluster Centers

Cluster	1	2	3	4	5
1		5.728	10.985	9.498	6.212
2	5.728		10.828	8.446	5.294
3	10.985	10.828		3.189	6.027
4	9.498	8.446	3.189		3.737
5	6.212	5.294	6.027	3.737	

NIPF landowners fell into Cluster 1 (n=27) scored lowest on both the need for certification and importance. They have moderate to low understanding of forest certification concepts and its role. This segment has somewhat neutral attitudes regarding stakeholder involvement in certification and the necessity of certification. Majority (66.7 percent) of the landowners in this segment did not have a management plan for their forestlands. Mean acreage of ownership is 1861 acres while 81.5 percent of the cluster members had an education level of college degree or above. Overall, Cluster 1 has *somewhat negative* attitudes towards certification and more than half (53.87 percent) of them opposed allowing certifiers to freely check forestry practices on their lands.

Cluster 2 representing only 6 percent of the respondents (n=28) have the *most negative* views of certification. They strongly disagreed with the need to adopt certification, and forest certification's role in sustaining health of NIPF lands as well as on industrial forest lands. They were highly skeptical of consumers paying a price premium for certified products and willingness of the public to support certification. This segment viewed certification as an unnecessary and unworkable concept at present which over-regulates private landowners. The segment is characterizes by landowners with low mean acreage of ownership, relatively lesser educated (50 percent with education of college or above), but high income members (Table 4.6). Majority (63 percent) of the landowners in this segment did not have a management plan for their forestlands. All the members of this segment refused paying any amount on certification

while 64.3 percent were against allowing certifiers freely entering their lands for inspections.

Cluster 3 representing 23.7 percent of the valid respondents indicates that there's a need to adopt certification on all forms of forest lands. They strongly believe that certification can sustain health of forests. Cluster members are adopting sustainable forestry practices on their lands at present and they scored highest for current understanding of certification concepts. They view certification as a necessary and potential mechanism to encourage sustainable forestry. Cluster 3 is has the *most positive* attitudes towards certification (Table 4.4).

About 45 percent of landowners in this segment have management plans for their forest lands. Mean acreage of ownership is 6357 acres; however, it was significantly affected by a single ownership of 583,000 acres. Only 8.5 percent of the landowners of this segment oppose allowing certifiers to freely check forestry practices on their lands. Majority (57 percent) was in favor of allowing independent inspections while 34 percent were neutral or undecided. The segment includes well educated and high income landowners (Table 4.6).

Respondents in Cluster 4 include 33.5 percent of the valid cases. The cluster is more or less similar to Cluster 3 in terms of in terms of their attitudes and views of certification. However, they believe certification over-regulates private lands and they question the willingness of the public to support certification. Overall, they have positive to neutral views on certification (Table 4.4). Mean acreage of ownership is 2651 acres which was again significantly affected by a single large ownership of 350,000 acres.

Majority (83 percent) of the landowners in this segment did not have a management plan for their forestlands. Most of this segment (68.7 percent) refused paying any amount on certification. Only 20 percent were against allowing free inspections on their lands while most (62 percent) were uncertain or have a neutral opinion.

NIPF landowners fell into Cluster 5 represents 30.4 percent of valid respondents. The mean acreage of ownership is 662 acres. They have a positive view regarding the need for certification and its role in sustaining the health of forests in comparison to Cluster 1 and 2 members. They appear to have average understanding and neutral view on certification concepts and related issues (Table 4.4). Only 12 percent of the segment was against allowing certifiers freely inspect their forestry operations while for the majority (47.3 percent), it was not an issue. Another 40.6 percent were indecisive. Most landowners (79 percent) in this segment did not have written management plan for their forestlands. Cluster 5 has the lowest education level comparatively. Derived clusters were named accordingly based on cluster member perceptions and views on certification (Table 4.6).

Table 4.6: Landowners Segment Demographic Profiles

NIPF Landowner Segment - views on certification	% of Respondents	Mean (Acres)	Age (55 yrs or above)	Income (\$60,000/yr or above)	Education (College degree or above)
Most Negative (MN)	6%	616	79%	85%	50%
Somewhat Negative (SN)	6%	1,861	63%	64%	82%
Neutral (N)	30%	662	72%	66%	49%
Somewhat Positive (SP)	34%	2,652	72%	61%	56%
Most Positive (MP)	24%	6,357	76%	77%	65%

In order to determine whether these clusters vary demographically, ANOVA test was conducted. Level of education proved to be the only demographic variable that differed between clusters ($p = 0.026$). Other variable means did not significantly differ among clusters (Table 4.7).

Table 4.7: Comparison of Clusters; ANOVA for Demographic Variables

Variable	Cluster 1 Mean (SN)	Cluster 2 Mean (MN)	Cluster 3 Mean (MP)	Cluster 4 Mean (SP)	Cluster 5 Mean (N)	ANOVA F-stat.	Sig. p-value
Age	4.85	5.25	5.16	5.11	5.13	0.69	0.596
Income	7.00	7.90	7.45	6.85	6.87	2.019	0.093
Education	3.70	3.54	3.94	3.57	3.47	2.804	0.026
Length of ownership	25.88	28.62	33.03	30.68	29.40	0.782	0.537

According to cluster analysis results, Cluster 3 is the most suitable group of landowners to target certification since they have positive attitudes towards certification. This segment was closely followed by Cluster 4. NIPF landowners in Cluster 5 have more or less neutral attitudes towards certification. Given more information, it is likely that this group will participate in certification. To effectively target this group, certification programs need to inform them about the importance of certification in improving the health of forests and potential economic benefits it could generate. Cluster 1 and 2 include landowners who have negative perceptions of certification. They are least likely to participate in certification hence, not viable groups to target certification.

In order to identify whether the landowner's willingness to pay for certification differs among these segments, ANOVA test was conducted. Results indicate that the mean willingness to pay per acre differs significantly among these segments ($p = 0.00$). Post Hoc Test (Tukey HSD test) results further illustrate where the difference really lie (Table 4.8). Although there are five clusters that differ in terms of their views on forest certification, they were difficult to distinguish based on the demographic variables collected from the survey. These segments might differ on other demographic characteristics we did not look at. Generally, NIPF landowners with larger acreage of ownerships tend to support or have positive views on certification.

Table 4.8: Post Hoc Tukey HSD Test Results for Significance

Cluster	N	Mean	vs Cluster	Significance (p)
1. SN	27	1.33	3	.040
2. MN	27	1.00	3	.000
3. MP	100	1.86	1	.040
			2	.000
			4	.010
			5	.000
4. SP	144	1.49	3	.010
			5	.006
5. N	131	1.14	3	.000
			4	.006

4.4 Discussion and Conclusions

Certification can be an opportunity for NIPF landowners, but landowners must plan and act years in advance to capture this potential opportunity. If certification continues to gain momentum in the marketplace, the pressure of participating in certification will inevitably reach NIPF landowners. The present survey mainly focused on determining how well NIPF landowners understand forest certification as well as their willingness to spend to become certified.

Respondent demographics shows that majority of the forestlands are owned by people in the age of 65 or above. Long term management decisions such as whether to become certified can also be influenced by age as well as respondent educational level. Past studies show that the general trend in NIPF ownership is increasing number of landowners and decreasing acreage of ownership as well as disposal of land rather than to acquire.

The reasons for owning forestlands tend to vary widely. Numerous studies (Hughes et al., 2003; Butler and Leatherberry, 2004) cite “as a family asset pass on to their heirs” as the main reason for forestland ownership. In contrast, present survey shows that NIPF landowners in Louisiana and Mississippi give more value for timber production. Hence, certifying NIPF lands in these states are crucial so that the landowners can receive the benefits of certification in the future while ensuring the long-term productivity in their lands.

Results indicate that landowners view certification more as a concept which is being promoted by environmental organizations and, as an extra burden to private landowners. However, a significant proportion of respondents (approximately 40 percent) believe certification could benefit NIPF landowners. For certification programs operating in the U.S., these groups should be the focus groups in private landowner certification discussion. Evidence

also suggests that much of the negative or neutral attitude of smallholders towards certification is partially due to lack of information and knowledge. Many are also skeptical of public willingness to support certification. However, they view certification can contribute to improve the forestry profession and management. Therefore, the voluntary and market-based nature along with other non-monitory environmental benefits of certification has to be emphasized by certification programs in the certification discussion.

In the present survey, questions targeted at identifying landowner knowledge on certification yielded higher number of “neither disagree nor agree” responses. This goes on to show that in Louisiana and Mississippi, private forest landowners currently know relatively little about forest certification. Majority and not entirely averse to having certifiers monitor their forest management activities and are likely to support certification unless there are no conflicts in landowner objectives and certification procedures. Private landowner organizations and approved professional foresters by certification organizations were viewed as the most trustworthy by NIPF landowners in administering certification. Therefore, these entities should be looked at as the most viable means of reaching NIPF landowners in introducing certification. Forestry community should be more involved in certification discussion.

From the results, it is evident that cost of certification continues to be a main certification issue. Voluntary certification programs often ask landowners to bear the costs of certification. In general, small landowners face higher per acre costs for forestry certification. Majority of NIPF landowners participated in the survey are not willing to pay this extra cost. Although many cited timber production as the primary reason for owning forestlands, they are not properly managed to generate maximum output. This is bolstered from the fact that majority do not have written management plans for their properties. Certification programs should look in to possibilities of

reducing the cost of certification. Some certification programs recently have targeted certifying forests owned by smallholders and taken measures to assist small landowners in meeting challenges through introducing programs such as group certification in order to bring down the certification cost.

The cluster analysis conducted on landowner responses for certification-related questions identified five NIPF landowner segments. Landowner profiles were developed using respondent demographic characteristics. Level of education is the most decisive factor in differentiating landowner segments, and the willingness to pay for certification varied significantly among these 5 clusters.

Landowners in Cluster 1 were not interested in nor do they indicate satisfactory level of behavioral involvement with sustainable forestry. Although members of Cluster 2 stated that they adopt sustainable forestry practices on their lands, they did not show sufficient interest in certification. Cluster 2 has the lowest willingness to pay for forest certification. Hence, these two segments would not be viable landowner groups for forest certification. Clusters 3 and 4 were found to be the most supportive landowner segments for certification followed by cluster 5. Cluster 3 and 4 are the ideal segments to target in promotion of certification. Although Cluster 5 exhibited the lowest mean willingness to pay for certification, their responses suggest that given more information, they are likely to participate in certification. These three clusters represent over 80 percent of the respondents.

All landowner segments are concerned over the availability of numerous certification systems, and agreed that consumers are confused by proliferation of certification programs. This goes on to show the current unsatisfactory level of understanding about forest certification among landowner groups, and emphasize the need for more information.

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CHAPTER 5

U.S. HOME CENTER RETAILER ATTITUDES, PERCEPTIONS, AND BEHAVIORS REGARDING FOREST CERTIFICATION

5.1 Introduction

The public concern for the environment has grown remarkably during the last few decades, both in developed and developing countries, and as a result environmental issues are beginning to take more of a center stage in global economic and trade policies. The emergence of forest certification; a process attempts to identify products from well-managed forests and indicate how well a product is environmentally adapted, is a contemporary example of how consumer interests have driven information processes aimed at differentiating the environmental appropriateness of goods and services.

Forest certification gives consumers a credible guarantee that the product they purchase comes from environmentally friendly sources. A credible certification program should evaluate the integrity of the producer's claim and the authenticity of product origin (Baharuddin, 1995). In order to provide the necessary information to the final consumer, Simula (1997) points out two essential components of any certification scheme; forest management certification and product certification. Product certification includes the tracking of timber from forest to final consumer through various production phases of the supply chain such as transportation, storage, processing and distribution; a process also known as 'chain of custody' certification. This study attempts to shed light on the often-neglected retail distributor of the supply chain, where eventual choices over certification implementation will be made.

After single family housing construction, repair and remodel applications of wood sold primarily through home center retailers accounts for the second largest demand market. Therefore, retail home centers have been the primary driver of certification from the demand side

of the equation in the U.S. According to the U.S. Census Bureau, the annual new home sales in 2005 was 1,282,000 with an average annual sales price of \$292,200, keeping the increasing trend in housing expenditure (NAHB, 2006). This can be attributed to strong growth in household income and wealth which has also given rise to a high-end market. Since the early 1990s, growth in spending on residential remodeling and repairs has remained steady. The estimated total expenditure on residential remodeling by U.S. consumers in 2005 was \$210 billion (JCHS Harvard University, 2005). The National Association of Home Builders (2006) predicts that this would increase up to \$238 billion in 2006. Retail expenditure on furniture by U.S. consumers has also shown a gradual increase over the years. For instance, consumer furniture expenditures increased by 6.4 percent in 2004 in comparison to the previous year (Vlosky, 2005). Consumer demographics is a highly influential factor in driving wood products market in the U.S. The generation “Baby Boomers” has been the mainstay of the U.S. wood products market for the last few decades. There are 75.8 million Baby Boomers, most reaching their peak spending years and their spending on home improvement projects reached \$72 billion in 2003 (JCHS Harvard University, 2005).

Evidence suggests that consumer preference for certified products and their understanding on certification concepts also on the rise. For instance, a comparative study by Ozanne and Vlosky (2003) on the U.S. consumer perspective on certification shows that overall consumer understanding of certification concepts has increased. Price Waterhouse Coopers also predicts an annual growth of 100 to 150 percent per year for certified products in the U.S. (Dixon, 1999). In another study on the impact of certification on preferences for wood furniture, Anderson and Hanses (2004) concluded environmental certification as a favorable product

attribute with nearly 21 percent of respondents giving it the top priority. However, for the typical respondent, the importance of other product attributes outweighed that of certification.

Availability of price premiums for certified products is an issue of continuous debate. Humphries et al. (2001) in their study revealed that although retailers pay more for certified products, on the sales side of the transaction, they receive a much lower premium or no premium at all. Based on their calculations for average premium paid to suppliers and premium received from sales, retailers lost an average of 6.1 to 6.4 percent on certified products. As the price premium for certified products get higher, consumers tend to go for the cheaper non-certified products (Anderson et al., 2005).

Despite the uncertainty over availability of price premiums, major wood products retailers specifically Lowe's and Home Depot have committed to providing "certified forest products" to consumers. Home Depot's Wood Purchasing Policy states in part that "the Home Depot will give preference to the purchase of wood and wood products originating from certified well managed forests whenever feasible". It also recognizes the Forest Stewardship Council (FSC) as the certification system with highest certification standards (Home Depot, 2006). Following the Home Depot's announcement of its new timber purchasing policy, several other leading Do-It-Yourself retailers such as Home Base, Menards, 84 Lumber, Lanoga, Wickes Lumber and Payless Cashways have announced policies to avoid purchasing timber products from non-sustainable sources.

At present, there are five leading certification systems operating in the U.S.; Forest Stewardship Council (FSC), Sustainable Forest Initiative (SFI), ISO 14000, Tree Farm, and Green Tag. The first three are typically used with large ownerships, and are more complex and costly. The last two are designed for smaller landowners, are less complicated, and less

expensive to implement. Each certification system has its own advantages and disadvantages. Which program will gain acceptability among forest landowners and the wood products industry including retailers remains a question.

Demand for certified products at present mainly comes from large companies wish to avoid the risk of damaging their brand image. A survey of certified forest product retailers in 1998 found that 86 percent of those surveyed expected an increase in sales volume for certified forest products (Humphries et al., 2001). The certified acreage of forest in the U.S. also continues to increase and by the summer of 2002, almost 30 percent of the U.S. timberland was enrolled in one of the five major certification systems (Moffat and Cubbage, 2002).

Although several major wood products retailers have already announced their commitment to provide certified forest products to their consumers, it is unclear which of the five major certification systems will ultimately be accepted by these major forest products retailers. This survey focuses on the home center retailer attitudes and participation regarding forest certification which has received relatively scant scholarly attention over the past few years. The study had two primary objectives: 1) ascertain perceptions of current and future forest certification trends, and 2) identify which certification systems are deemed acceptable and preferable.

5.2 Methodology

Over the fall of 2005-spring 2006 period, a mail questionnaire was sent to the 500 largest home center retailers in the U.S. based on gross sales in 2004. The mailing list was purchased from Home Channel News. The purpose of this survey was to determine trends in home center certification strategies, certification systems accepted or under consideration, certification criteria important to these retailers and other related trends in the home center sector.

The questionnaire contained both scale and fixed response questions. Scale questions were used to measure constructs or major concepts. The scales of measurement included nominal, ordinal, and interval. In addition, 5-point scaling questions, anchored by 1 = strongly agree to 5 = strongly disagree and by 1 = very important to 5 = very unimportant, were employed to measure the respondent's level of agreement with various questions addressing certification. The questionnaire also contained fixed response questions and open-ended questions which allow respondents to express thoughts and ideas not covered in the fixed format questions.

The questionnaire was pre-tested with a sub-set of 20 representatives from the sample and revised before the final mailing. Mailing procedures followed the Tailored Design Method (Dillman 2000), and included a pre-notification postcard, the first questionnaire mailing with a postage paid return envelope, a reminder postcard, and a second mailing to first-mailing non-respondents. Cover letters that accompanied the questionnaires were personally signed by the principal investigator and the confidentiality of the respondents was guaranteed.

5.2.1 Data Handling and Analysis

The survey variables were entered into two databases in Microsoft Excel. The first database was used to keep the records of returned responses, undeliverable surveys, name and address changes. A second database was maintained to store responses from each respondent in a way to ease the process of further analysis. The statistical analysis of the data was done mainly using SPSS; a statistical package widely used in social sciences studies. The analysis mainly used descriptive statistics including simple frequencies and mean responses, correlation tests and t-tests. In order to come up with meaningful interpretations, respondents were classified into 3 groups (large, medium and small scale firms) based on their sales in 2004. Analysis of Variance (ANOVA) tests were employed to distinguish whether the relative importance of criteria they

used in selecting wood product suppliers vary with the scale of a firm. Common factor analysis was carried out with 21 criteria variables to identify underlying dimensions that home center retailers looked at in selecting wood product suppliers.

5.3 Results

5.3.1 General Profile

Of the 500 mailed questionnaires, 132 were returned as usable. After accounting for non-deliverables and seven respondents that did not sell wood products, the adjusted response rate was 26 percent. A third of respondents (32 percent) are headquartered in the South, followed by the North Central, Northeast and Western regions with 27 percent, 23 percent, and 18 percent of respondents, respectively (Figure 5.1).

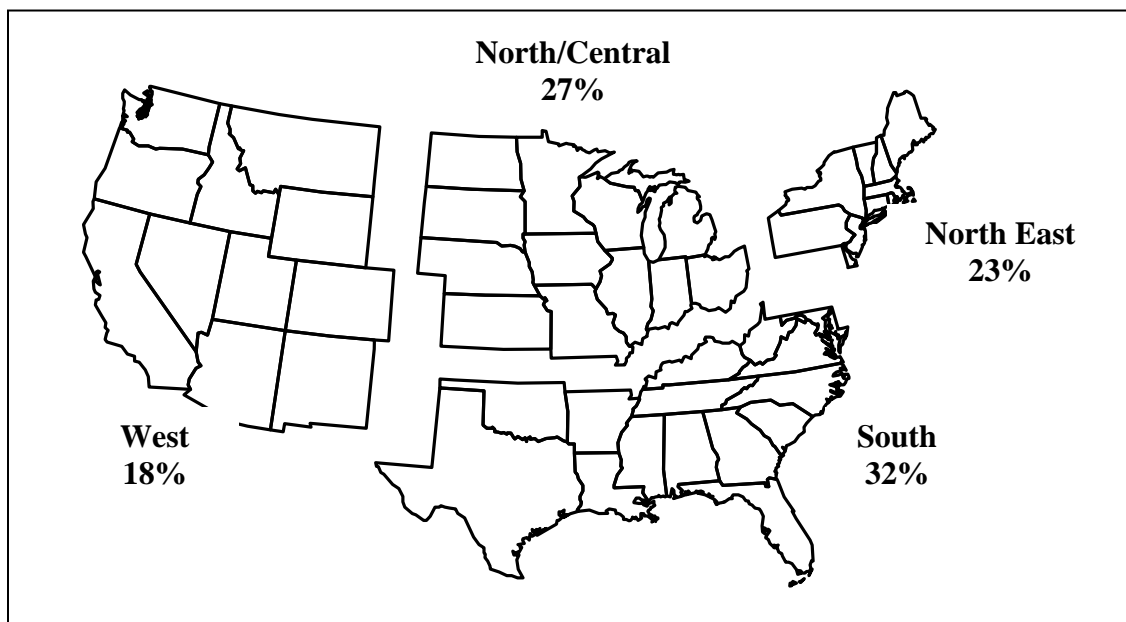


Figure 5.1: Distribution of Respondent Corporate Locations - Percent of Respondents (n=126)

In order to mask responses from the five respondent companies in the top 20 U.S. home centers, respondents were segmented into large, medium and small companies based on their 2004 total sales (Large; sales of \$ 200 million or more, Medium; sales of \$ 51-199 million,

Small; sales of \$ 50 million or less). Fifty-six percent of respondents are small scale with 2004 sales of \$50 million or less. This group was followed by medium scale companies that accounted for 36 percent of the respondents. Large scale companies accounted for only 6.5 percent of the sample. Similarly, 90 percent of respondents had 500 or fewer employees in 2004. On the other end of the scale, 6 percent of respondents had sales of \$200 million or more and about 10 percent of respondents had more than 500 employees in 2004. Majority of the companies (78 percent of the respondents) had more than 100 employees in 2004.

All respondents sold wood products with molding and millwork, softwood lumber, softwood plywood, and treated wood products carried by 91 percent of respondents (Figure 5.2).

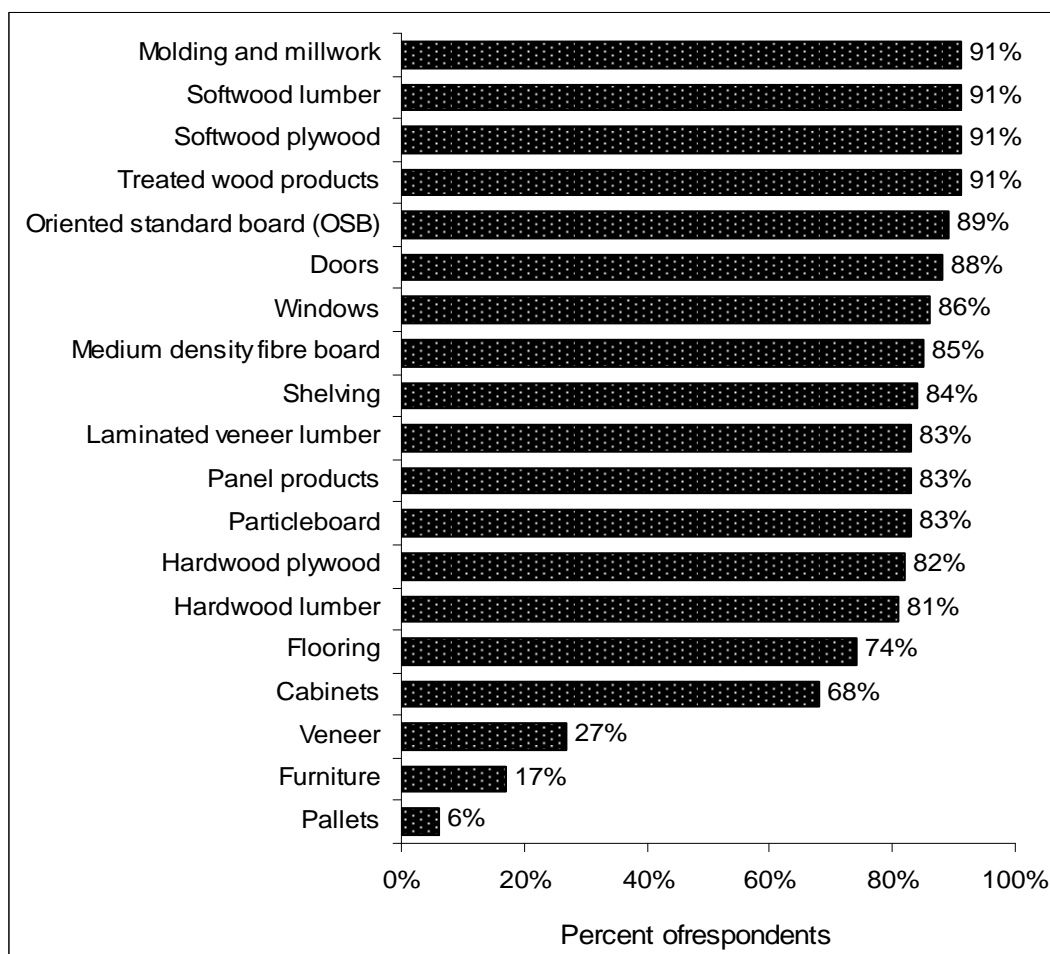


Figure 5.2: Wood Products Sold by Respondents (Percent of Respondents, n=121)

Contribution of wood products for respondent annual sales showed a wide range. For 79 percent of respondents (n=121), wood products accounted for over 50 percent of the total sales in 2004. Only 7.4 percent of the respondents said wood products comprised less than 20 percent of their sales in year 2004 (Figure 5.3).

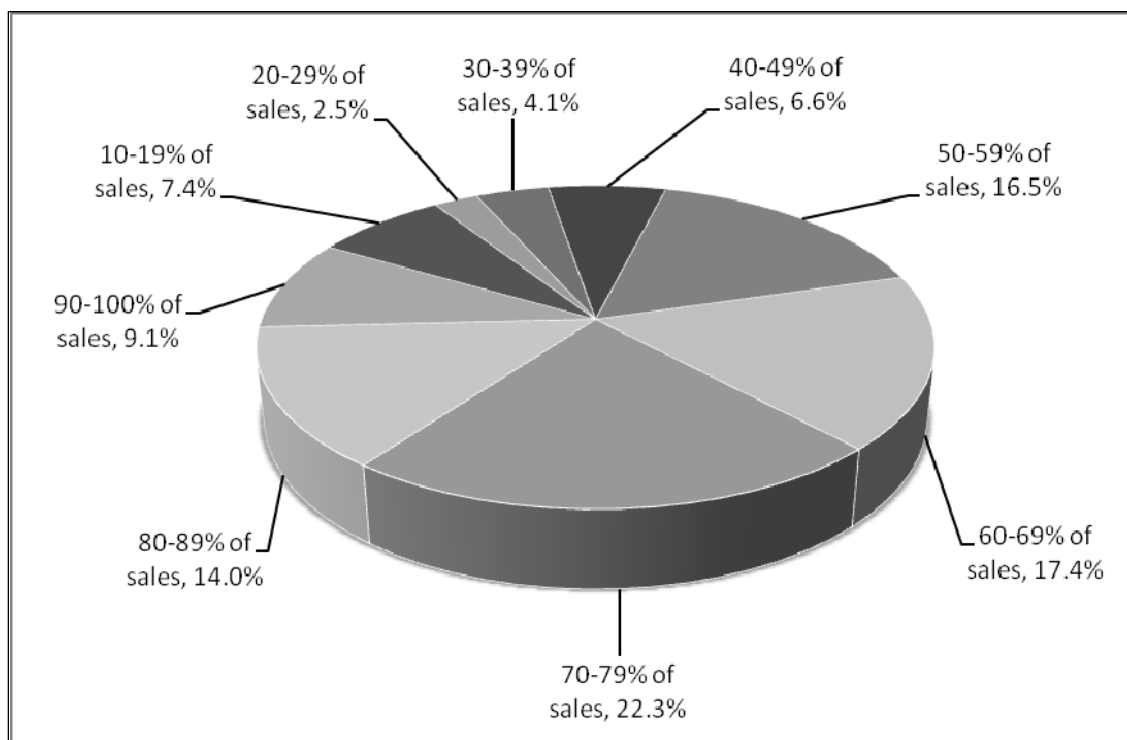


Figure 5.3: Percent of Sales Attributed to Wood Products (Percent of Respondents, n=121)

Respondents purchase wood products from a variety of suppliers. Allowing for multiple responses, the U.S. brokers or wholesalers was the main purchasing channel for wood products for 94 percent of respondents followed by direct international manufacturers, and international brokers/wholesalers at 27 percent and 26 percent of respondents respectively. Fourteen percent of respondents purchase wood products from U.S. brokers/wholesalers and 13 percent make purchases directly from the U.S. manufacturers (Figure 5.4).

Respondents were also asked to provide information on the origin of wood products they sell. Different geographical regions were provided in the questionnaire for the convenience.

Again, allowing for multiple responses, 93 percent of respondents said wood products they purchase are from sources in North America, followed by South America and Europe. Africa and Oceania were the least ranked geographical regions of origin for wood products sold in the U.S. by leading home center retailers (Figure 5.5).

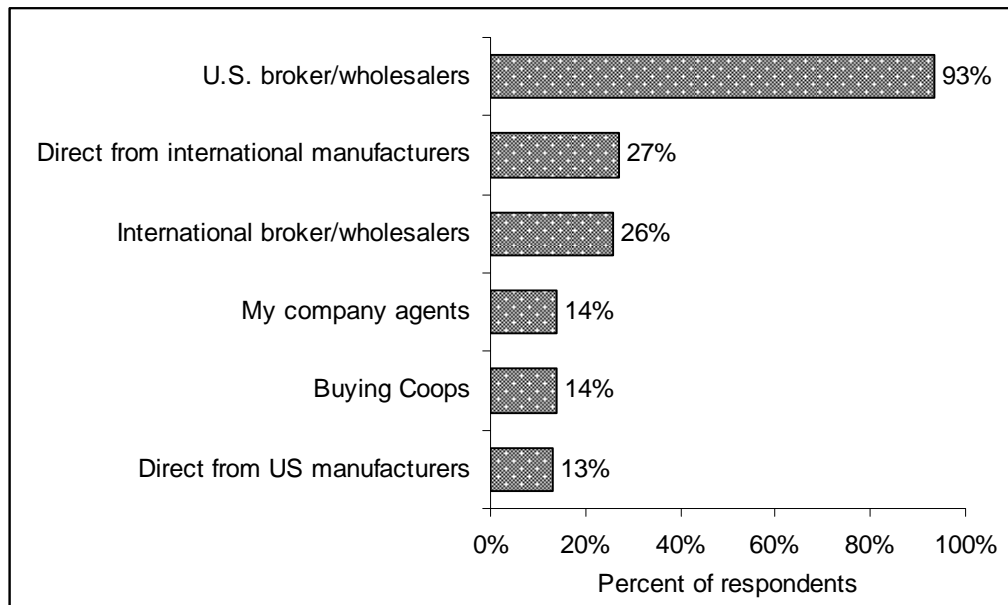


Figure 5.4: Main Purchasing Channels for Wood Products (n=126)

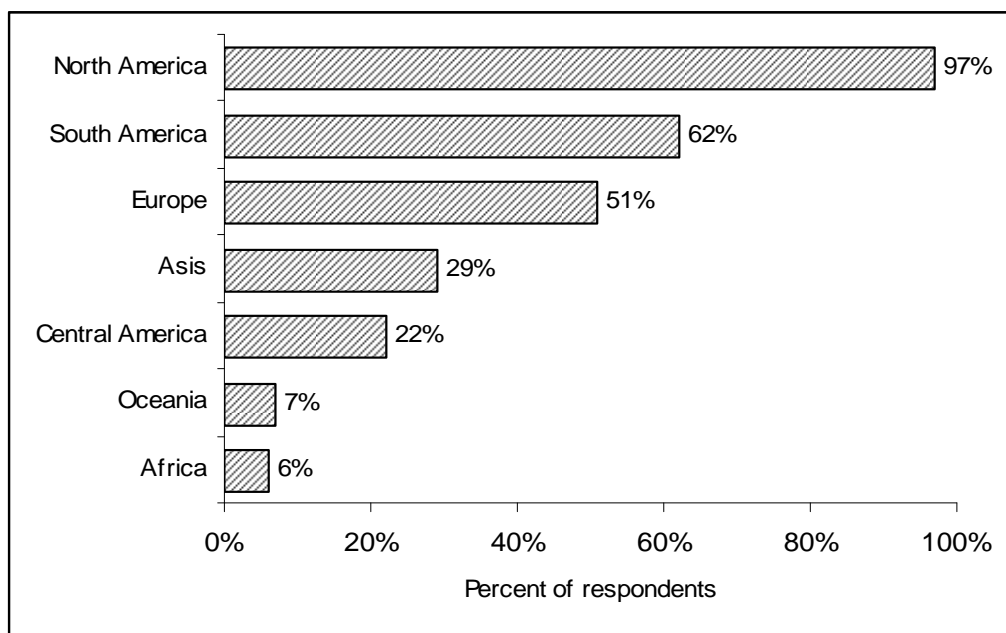
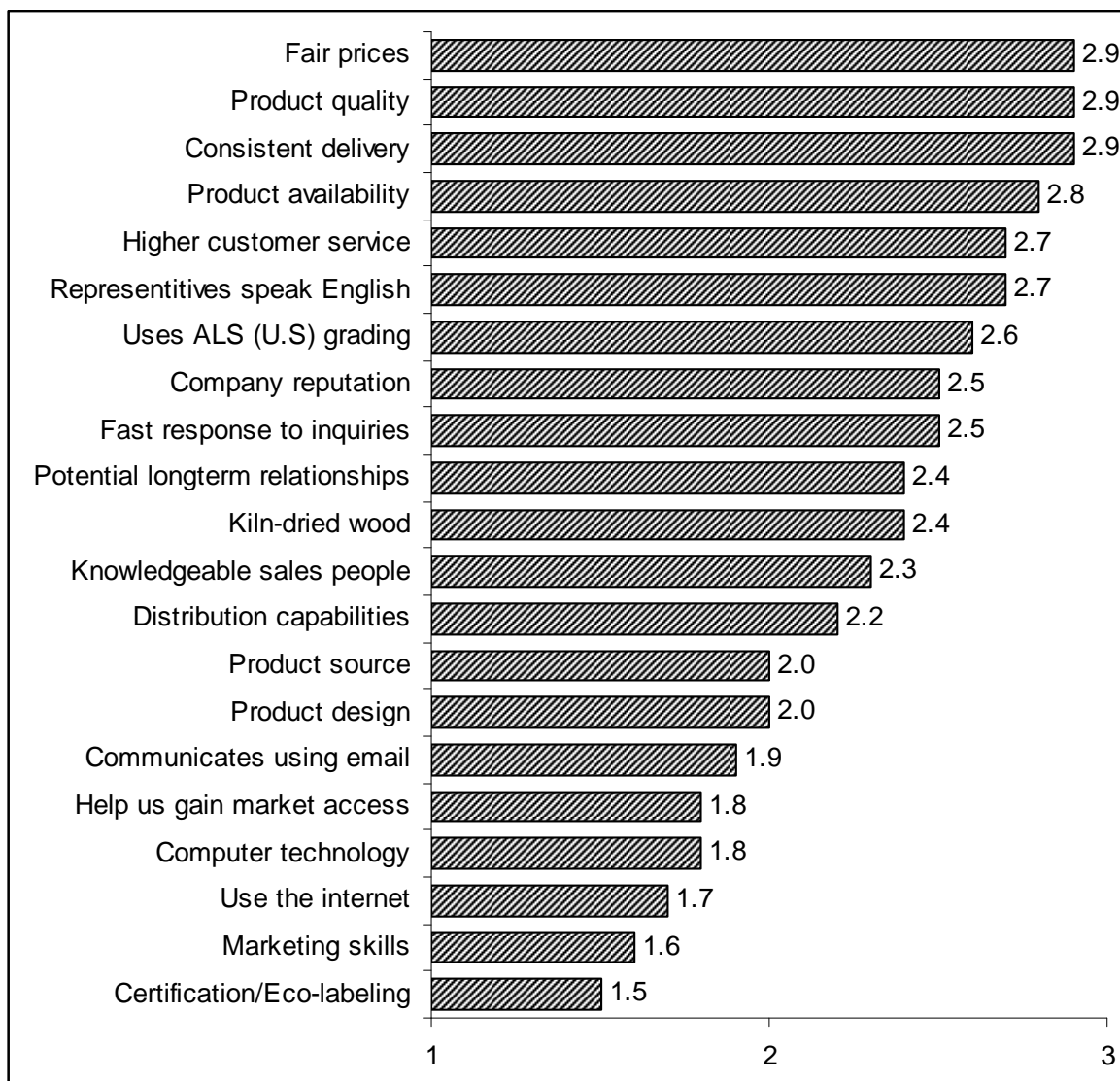


Figure 5.5: Origin of Wood Products Sold by Leading Home Center Retailers

Using a 3-point scale (1=Not Important at All; 2=Somewhat Important; 3=Very Important), respondents were asked to rate the relative importance of criteria they use to select wood product suppliers (Figure 5.6). Fair prices, product quality, and consistent delivery ranked at the top (2.9) closely followed by product availability (2.8), high level of customer service (2.7), and the need for supplier representatives to speak English (2.7). Ironically, certification or eco-labeling was ranked last from the list of 21 criteria.



1=Not important at all 2= Somewhat important 3=Very important

Figure 5.6: Criteria Used in Selecting Wood Product Suppliers by Home Center Retailers -Level of Importance (n=132)

5.3.2 Underlying Factors of Criteria Used in Selecting Wood Product Suppliers

Common factor analysis was carried out with 21 criteria variables to identify underlying dimensions that home center retailers looked at in selecting wood product suppliers. Factor analysis is a data reduction statistical approach that compresses the information contained in a number of original variables into a smaller set of dimensions/factors with a minimum loss of information (Hair et al., 1998). The technique is based on the correlation matrix of the variables involved, and correlations usually need a large sample size before they stabilize.

Both Kaiser-Meyer-Olkin (KMO) and Bartlett's tests provide a minimum standard which should be satisfied before a factor analysis can be conducted. The KMO test measures the sampling adequacy. This measure varies between 0 and 1, and values closer to 1 indicate better sample adequacy (Hair et al., 1998). In this case, a value of 0.697 suggests that the sample is adequate. Bartlett's test ($p=0.000$) also indicate that the data set is suitable for factor analysis. Communalities explain the proportion of each variable's variance that can be explained by the factors. Variables with high values indicate that they are well represented in the common factor space, while variables with low values are not well represented. In this analysis all variables have high values hence, are well represented in the common factor space.

Of the total 20 variables included in the model, 7 common factors were extracted based on the Eigen value criterion. These 7 factors accounted for 67 percent of the total variance (Table 5.1). Orthogonal varimax rotation was used to disperse the factor loadings within the factors to achieve a more interpretable solution (Field, 2000 in Vlosky and Dunn, in review).

The Rotated Factor Matrix contains correlations between the variable and the factor. Table 5.2 shows the coefficients for the rotated factor loadings. It is generally recommended that factor loadings of at least 0.60 be used for samples with greater than 85 observations to identify

those statistically significant (Hair et al., 1998). Based on these correlations, extracted 7 factors were named accordingly. All significant factor loadings were used in naming the seven factors.

Table 5.1: Total Variance Explained by Common Factors Components (n=132)

Component	Initial Eigen values		
	Total	% of Variance	Cumulative %
1	4.396	20.934	20.934
2	3.098	14.753	35.687
3	1.751	8.340	44.027
4	1.386	6.601	50.628
5	1.227	5.845	56.472
6	1.131	5.383	61.856
7	1.013	4.825	66.681
8	0.894	4.255	70.936
9	0.820	3.903	74.839
10	0.755	3.594	78.433
11	0.699	3.326	81.759
12	0.558	2.657	84.416
13	0.536	2.552	86.968
14	0.508	2.418	89.387
15	0.474	2.255	91.642
16	0.383	1.824	93.465
17	0.358	1.705	95.170
18	0.329	1.569	96.739
19	0.313	1.489	98.228
20	0.226	1.075	99.303
21	0.146	0.697	100.000

Extraction Method: Principal Component Analysis

Factor 1 has high loadings from four variables with greater contributions from variables that address marketing and distribution. Therefore, it was named as “**Marketing and Logistics**”. Factor 2 has higher loadings from three variables which are all related to using various forms of media to communicate, thus the factor was named “**Communication**”. Factor 3 has four components with significantly higher loadings from variables associated with price, quality and availability. Hence, the factor was named “**Product Attributes**”. Factor 4 has high loadings from variables which are all related to better customer care and building long-term relationships with customers. Accordingly, the factor was named “**Customer Relations**”. Factor 5 has two

significant loadings that address proper documentation, leading to the origin of the product.

Hence, the factor was named “**Product Origin**”. Factor 6 has two components with high loadings from variables that deal with “**Product Standards**”. Factor 7 has high loadings from one variable, and therefore named as “**Company Reputation**”. These factors seems to be the underlying dimensions of the factors that home center retailers looked at in selecting wood product suppliers.

Table 5.2: Factor Analysis of Supplier Selection Criteria (n=132)

Variables	Factor						
	Marketing and logistics	Commun-ication	Product attributes	Customer relations	Product origin	Product standards	Company reputation
• Marketing skills	0.770	0.187	-0.080	0.037	0.073	0.033	0.134
• Distribution capabilities	0.750	0.084	0.142	0.201	-0.156	-0.045	-0.032
• Helps us gain access to markets	0.705	0.236	-0.070	0.099	0.219	-0.058	0.147
• Product design	0.603	0.037	0.105	-0.158	0.375	0.210	0.032
• Uses the Internet	0.170	0.889	-0.096	0.023	-0.020	-0.078	0.017
• Communicate through email	0.068	0.826	0.051	-0.047	0.090	-0.014	0.075
• Computer technology capabilities	0.460	0.697	-0.033	0.191	-0.025	-0.035	0.039
• Product quality	-0.117	-0.045	0.739	0.169	0.060	0.079	0.223
• Consistent delivery	0.109	-0.048	0.717	0.379	0.051	0.114	-0.081
• Fair prices	-0.026	0.115	0.709	-0.051	-0.075	0.210	-0.104
• Product availability	0.174	-0.183	0.564	0.067	-0.244	-0.046	0.316
• Fast response to inquiries	0.027	0.188	0.170	0.811	0.130	0.000	0.082
• Representatives speak English	0.078	-0.043	0.124	0.582	-0.263	0.408	0.006
• High level of customer service	0.375	-0.294	0.331	0.564	0.162	-0.044	0.201
• Knowledgeable sales people	0.270	0.287	0.092	0.550	0.109	0.188	0.352
• Source of the products	-0.001	-0.017	-0.062	0.260	0.850	0.055	0.075
• Certification/Eco-labeling	0.377	0.086	-0.040	-0.207	0.681	0.007	-0.113
• Wood is kiln-dried	-0.041	-0.110	0.026	0.024	0.100	0.801	0.159
• Uses ALS (U.S.) grading standards	0.065	0.019	0.268	0.098	0.005	0.776	-0.072
• Company reputation	0.074	0.035	0.074	0.014	-0.033	0.024	0.885

Extraction Method: Principal Component Analysis. Rotation Method: VaOrimax with Kaiser Normalization. Rotation converged in 9 iterations.

5.3.3 Homecenter Retailers and Certification

The questionnaire specifically addressed homecenter retailer perceptions, preference, and experience with certified forest products. According to study results, 33 percent of respondents (n=42) said that they sold certified wood products and, of the 67 percent that did not sell certified products, 19 percent said they planned to do so in the future. Nineteen percent of respondents that were selling certified products have obtained COC certification while 60 percent have not, and 21 percent said they did not know. Annual wood products sales (Spearman $R = -0.487$, $p = 0.001$) and number of employees (Spearman $R = 0.643$, $p = 0.001$) showed somewhat strong and significant correlation with participation in certification/obtaining COC certification; large scale retailers tend to obtain certification. Respondents were also asked about their company's approximate percentage of certified wood products sales of their total wood products sales. For the 32 respondents that answered this question, on average 38 percent of the company total wood product sales (by value) are certified.

Respondents were asked why they entered the certified wood products market (Figure 5.7). The most cited reasons (29 percent of respondents) were "it was the only product available" and "improve company image." This was followed by customer demand, increase sales volume, and business owner commitment to environmental issues. Pressure from environmentalists, avoidance of business risk, and seeking increased profits were least ranked reasons.

Identifying current and future certification programs acceptable to home center retailers was a prime objective of this study. For the 41 respondents who sell certified products, FSC certification is the most accepted and preferred scheme followed by SFI certification (Figure 5.8). Green Tag, PEFC and Tree Farm certification programs were ranked next for both acceptance and preference.

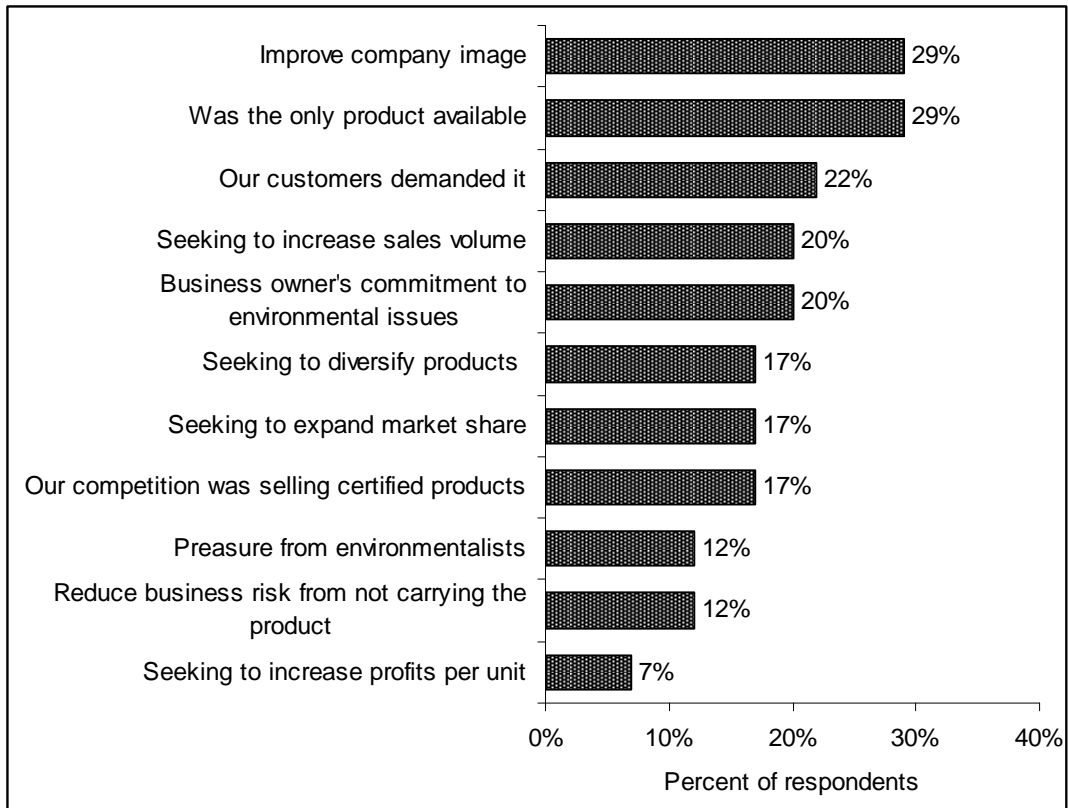


Figure 5.7: Reasons for Entering the Certified Wood Products Market (Percent of Respondents-Multiple Responses Possible, n=41)

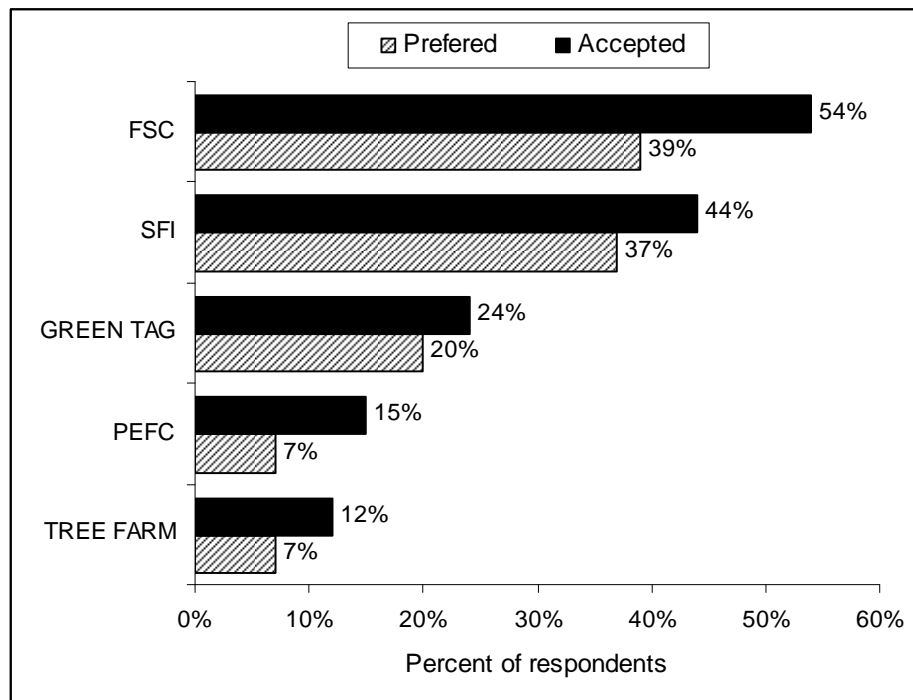


Figure 5.8: Home Center Retailer Acceptance for Different Certification Schemes (Percent of Respondents-Multiple Responses Possible, n=41)

We also examined cost aspects of certification. When asked about the premium paid for certified wood products relative to non-certified alternatives, 50 percent of respondents (n=21) said they do not pay anything extra for certified wood products (Figure 5.9). Eleven percent of respondents said they pay more than 10 percent for certified wood products relative to comparable non-certified wood products. Kruskal-Wallis test statistic further indicate that price premiums paid for certified products by retailers do not statistically differ significantly with company size ($p = 0.669$).

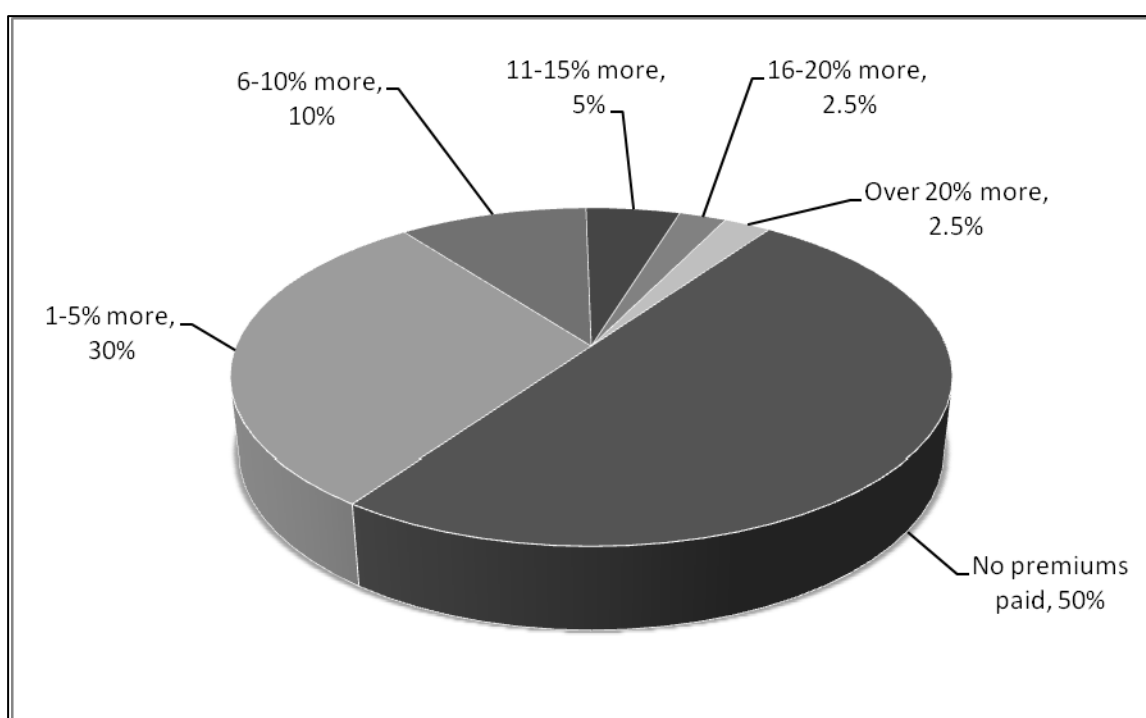


Figure 5.9: Premiums Paid for Certified Wood Products Relative to Non-certified Products (Percent of Respondents, n=41)

About 13 percent of certified wood products retailers (n=5) have requested that wood suppliers to become certified. No respondent experienced unexpected costs due to participating in certification while 5 percent of respondents said they experienced unexpected benefits. When asked about certification promotion, 11percent (4 respondents) of certified wood seller respondents said that their company actively promotes its products as certified to customers.

Twenty-nine percent (n=11) said their certified products carry an eco-labels, 55 percent said they do not and 16 percent were unsure if their certified wood products carry an eco-label.

Finally, we were interested in home center retailer perceptions of past and future demand for their certified wood products sales. Sixty-two percent of certified wood products retailers (n=26) have experienced a moderate or significant increase, and no respondent experienced a decrease in sales of certified wood products over the past 5 years (Figure 5.10). A majority (69 percent, n=29) anticipate a moderate or significant increase in certified wood sales in the next 5 years. Three percent said they expected sales would decline somewhat and no respondent thought certified wood sales would decrease significantly.

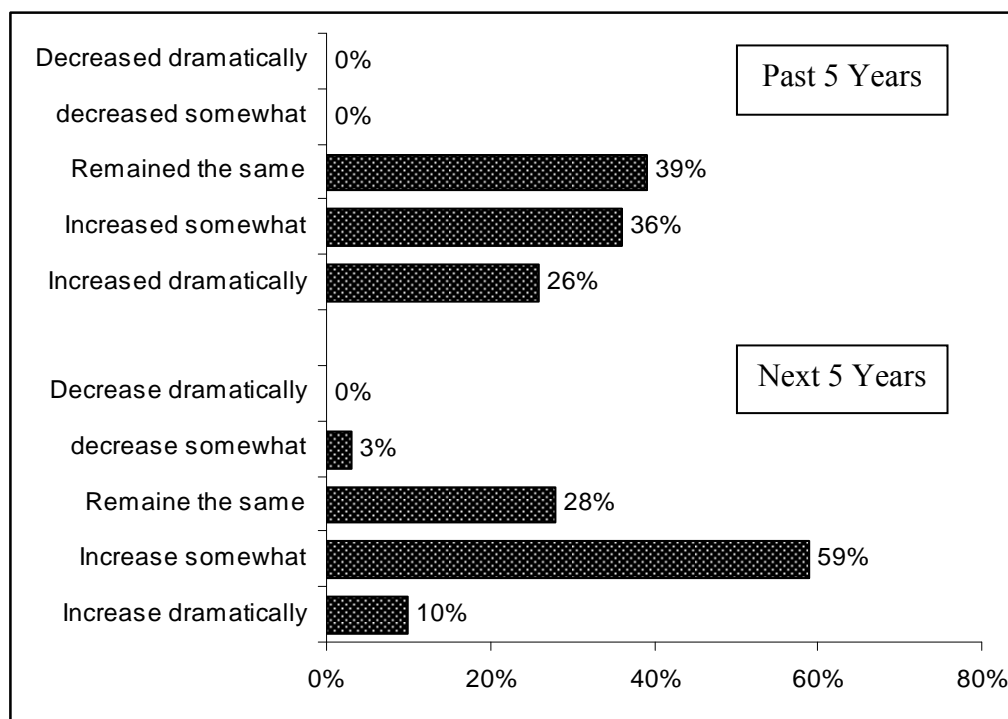


Figure 5.10: Past (5-year) and Expected Future (5-year) Changes in Sales Volume for Certified Products (Percent of Respondents (n=39))

In order to test whether the retailer past experiences and future expectations regarding certified products sales vary with the company size, Kruskal-Wallis test was conducted (assumption of normality was not met). No statistical significance was observed both for past

experiences ($p=0.103$) and future expectations ($p=0.607$) in certified products sales with company size.

As previously stated, respondents were segmented into large, medium and small companies based on their total sales in year 2004. Analysis of Variance (ANOVA) tests were employed to distinguish whether the relative importance of criteria used in selecting wood product suppliers would vary with the scale of the firm. Results suggest that the criteria did not change significantly with firm size (Table 5.1). However, a significant difference between groups ($p=0.041$) was observed for preference of kiln-dried wood.

Table 5.3: Variation of Criteria Used in Selecting Wood Product Suppliers (ANOVA results)

Criteria	Mean scores			F	Significance (p)
	Large (n=8)	Medium (n=47)	Small (n=68)		
Company reputation	2.50	2.47	2.51	0.252	0.778
Fair prices	3.00	2.79	2.90	1.852	0.161
Product quality	3.00	2.91	2.91	0.260	0.772
Product availability	2.75	2.87	2.76	0.995	0.373
Knowledgeable sales people	2.38	2.23	2.29	0.237	0.789
Fast response to our inquiries	2.75	2.53	2.53	0.673	0.512
High level of overall customer service	2.50	2.77	2.63	1.503	0.227
Consistent delivery	3.00	2.91	2.79	1.881	0.157
Helps us gain access to markets	2.00	1.77	1.87	0.529	0.590
Distribution capabilities	2.25	2.28	2.18	0.314	0.731
Marketing skills	1.63	1.60	1.60	0.008	0.992
Computer technology capabilities	2.25	1.77	1.72	2.336	0.101
Potential for long-term relationship	2.50	2.40	2.32	0.417	0.660
Uses the Internet	1.88	1.77	1.69	0.356	0.701
Can communicate through email	2.38	1.87	1.81	2.775	0.066
Source of the products that they sell us	2.25	1.91	2.01	1.206	0.303
Certification/Eco-labeling	1.63	1.40	1.62	1.767	0.175
Wood is kiln-dried	1.88	2.30	2.50	3.273	0.041
Uses ALS (U.S.) grading standards	2.63	2.61	2.57	0.058	0.944
Representatives speak English	2.75	2.77	2.68	0.485	0.617
Product design	2.14	1.82	1.97	2.024	0.137

5.4 Discussion and Conclusions

Results from the present study better frame certification-related issues from the perspective of wood products retailer looking for the best way to market and sell the products. Despite the fact that present wood product retail business is dominated by few leading companies, it is equally important to assess the views of other medium to small scale companies' perspective on certification, and the present survey addresses both these aspects.

Although previous reports (Price Waterhouse Coopers in Dixon, 1999) predicted a significant growth in demand for certified wood products in US, the results suggest that only handful of leading wood products retailers have joined certification and obtained chain of custody certification. Product quality, fair prices and supply issues are still regarded as main concerns rather than environmental safeguarding by home center retailers in order to be successful in the business. This is evident from the fact that eco-labeling being ranked last from a list of 21 criteria for selecting product suppliers. The relative importance in selecting wood product suppliers did not change with the company size.

Results indicate that in general, price premiums for certified products are rare. However few companies participated in the survey experiencing unexpected benefits after joining certification suggests the existence of niche markets for certified products. Other factors such as improving company image and suppliers already became certified seems to be the main reasons for companies to enter to certified market rather than price premiums. If certification is to gain momentum in the future marketplace, the demand should come from the end users, which would motivate more profit-driven companies in the retail business to join certification.

FSC and SFI certification schemes are accepted by most retailers at present, followed by Green Tag, PEFC and Tree Farm. These two certification programs are likely to remain as the

top certification programs preferred and accepted by retailers in the future as they continue to dominate the certified forest acreage in the country. Green Tag is likely to immerge as the third leading certification standard in the future. On the sales side, home center retailers have experienced an increase in their sales volume for certified products during the recent past and they remain optimistic that it would continue to rise in the future. This can be attributed to the anticipated increasing awareness among their customers.

None of the companies have experienced any unexpected costs due to certification. For various certification programs, this can be viewed as a positive sign and, they should look to emphasize other aspects of certification such as the opportunity it gives to gain competitive advantage by positioning products favorably against products with higher environmental burdens, increasing overall efficiency through better management, and deflecting negative image in promoting certification.

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CHAPTER 6

GENERAL DISCUSSION AND CONCLUSIONS

6.1 NIPF Landowners, Home Center Retailers and Certification

The present study was conducted using two mail surveys pertaining to forest certification. The landowner survey sought to determine how well NIPF landowners understand forest certification concepts as well as the amount of money they are willing to spend to become certified. The home center survey sought to ascertain home center retailer perceptions of current and future forest certification trends as well as certification systems deemed acceptable to them at present, and in the future. These perspectives are critical so that landowners have access to all possible markets for their forest products. Investing in forestland is a long-term enterprise, and helping NIPF landowners plan for the future is a long-standing goal of extension. These studies better frame certification-related issues from the perspectives of both the forest landowner seeking to sell timber and the retailer looking for the best way to market and sell the products that originate from certified forests.

The present survey shows that NIPF landowners in Louisiana and Mississippi give more importance for timber production on their lands which makes the introduction of sustainable forestry practices on their lands much more important. The general attitude of Louisiana and Mississippi NIPF landowners towards forest certification is not encouraging and, certification is considered as an extra burden by them. However, they believe certification can improve the forestry profession and management while significant proportion is optimistic of its potential benefits. This section should be the focal group in NIPF landowner certification discussion. When it comes to promoting certification, these landowners should be reached via private landowner organizations and approved professional foresters by certification organizations since

these two means are the most trusted by landowners. It is likely that participation of private landowners in certification would increase if the cost of certification can be brought down. Awareness building also plays a key role. The present negative attitude of landowners towards certification is partly due to lack of knowledge/information. Therefore, it is critical to make the landowners aware of potential monetary benefits as well as environmental and social benefits of certification so that they will think adopting certification is the 'right thing to do' in terms of all aspects.

The wood products retailing business in the U.S. on the other hand is dominated by few leading companies and several market leaders have already committed to buy certified forest products. FSC and SFI certification programs at present have a stronghold in the certified products market. These two programs are the mostly accepted by retailers at present and, likely to be accepted in the future. Based on the results, Green Tag is the third leading certification standard at present.

Home center retailers in general give a low priority for certification/eco-labeling in wood products procurement. Instead, they pay higher attention on product quality, availability and consistent delivery because they feel these are the more important factors to survive in the present market. Certified products should also have the above qualities if they are to become acceptable in the market.

According to home center retailers, consumer demand for certified products is not that significant at present. However, many retailers believe certification will become an important issue in the future. If present trend continues and certified products continue to flow through supply channels, it will give additional opportunity for home center retailers to promote certified products to their customers.

Interestingly, certification cost has not been viewed as a serious issue by any responding retailer. As in the case of landowners, the present negative or neutral attitude of home centre retailers towards certification can be partially attributed to lack of knowledge/information on current and future market developments. Therefore, steps should be taken to build awareness among wood products sellers and emphasize variety of potential benefits certification could offer in promoting certification.

6.2 Implications

Non-industrial private forestland owners comprise a significant part of forest ownership in southern U.S. Studies have shown that NIPF landowners' goals and objectives for their forestland are diverse. In the context of forest certification, initiatives are being developed by certifiers to accommodate the unique ownership characteristics of NIPF landowners. So far, there has been limited research conducted on southern NIPF landowner reaction to forest certification. This research partially fills that gap by better understanding current and future acceptance of forest certification systems by NIPF landowners in Louisiana and Mississippi.

The findings of this research are a foundation for different certification programs to plan out viable alternative strategies to reach NIPF landowners. Products and results from this effort are applicable to other southern states as well. The research findings will also be useful for the State Government/forestry professionals in formulating new policies and extension programs to introduce and promote sustainable forestry practices in the south. For instance, previous studies (Teisl et al., 2001) show that bringing down the cost of forest certification would greatly increase the small holder's participation in forest certification programs. Therefore, introduction of a subsidy in the form of tax waive to encourage sustainable forestry would be a viable option. Understanding private landowner's perceptions is vital in taking such policy decisions. In the

future, domestic and international market forces and trade policies are likely to place increasing importance on environmentally responsible forest practices (ITTO, 2003). Effective mechanisms that encourage NIPF landowners to adopt such practices could result in both an enhanced quality of life in rural south and give them forest products market advantage. Forest certification offers a potential approach for achieving both of these objectives.

The survey on home center retailers also has several implications. Knowing the certification systems that are currently accepted and will accept in the future by retailers is of particular interest to leading certifiers so that they can come up with innovative approaches to maintain the stronghold of certification in the U.S. market. On the other hand, home center retailers are the segment of the value chain which directly interacts with consumers. Higher demand for certified products gives an indirect measurement of consumer awareness regarding environmental issues associated with forest products trade. Therefore, this study provides insights to both retailer and consumer awareness of certification. These perspectives are of utmost importance on the side of landowners because noticeable increase for certified products in the past experienced by retailers and, positive future predictions for continuous demand growth hints potential benefits of certification to the landowner.

6.3 Limitations of the Study and Lines of Future Research

The primary research tool used in this study is a mailing survey. Mail surveys inherent several disadvantages. Low response rate, coverage errors (errors rising due to failures in procuring an accurate list of people/firms in the population from which to draw the sample), inflexibility of the method and reliability of information provided, are some of them (American Statistical Association, 1997). Furthermore, many times business questionnaires get handed to other employees for completion. Hence, the respondents are not exactly being the targeted

audience. Questions specifically designed to test the knowledge on issues such as sustainability and certification may yield biased results since education of the respondent strongly influence their answers. However, precautions were taken to minimize these potential errors in designing and planning out the survey.

Forest certification is relatively a new concept that gained momentum over the years. The knowledge of certification among consumers, NIPF landowners, retailers, and manufacturers are still growing. The present study was focused entirely on NIPF landowners and home center retailers. It is worthwhile studying the other segments of value chain such as consumers and manufacturers so that a clear picture of certification could be obtained. Cost of certification seems to be a primary issue for both parties, especially for private landowners. A separate study/survey can be conducted to investigate and identify the best alternative preferred by landowners from a variety of possible measures (tax waivers, incentives etc.) to promote certification in the south.

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APPENDIX A

LOUISIANA AND MISSISSIPPI NIPF LANDOWNER SURVEY

Section I. Forestland Ownership
--

1. Do you own forestland in Louisiana or Mississippi? (Please circle the correct response).
 1. NO-----→ IF NO, **PLEASE STOP HERE AND RETURN THE SURVEY IN THE POSTAGE PAID ENVELOPE.**
 2. YES-----→ How Many Acres? _____
→ Please identify the Parish(es) /County(ies) where your forestland is located:

2. How much forestland have you acquired in the last 10 years in Louisiana/Mississippi?
_____ Acres
3. How much forestland have you disposed of (sold or deeded to others) in the last 10 years in Louisiana/Mississippi?
_____ Acres
4. In which of the following ownership categories does the major portion of your forestland holding fall? **(Please circle only one.)**
 1. INDIVIDUAL (JOINT SPOUSE OWNERSHIP OTHER THAN FAMILY CORPORATIONS)
 2. INDIVIDUAL (JOINT CHILDREN, SIBLINGS AND EXTENDED FAMILY OWNERSHIP OTHER THAN FAMILY CORPORATIONS)
 3. PARTNERSHIP
 4. CORPORATE
 5. LIMITED LIABILITY CORPORATION (LLC)
 6. FAMILY LIMITED PARTNERSHIP (FLP)
 7. CLUB OR ASSOCIATION
 8. OTHER (PLEASE SPECIFY) _____
5. If your ownership has a business or association with it, what is the nature of the organization? **(Please circle only one).**
 1. FOREST INDUSTRY (SAWMILL, PULPMILL, ETC..)
 2. FARM INDUSTRIAL BUSINESS (MANUFACTURING, MINERAL EXTRACTION, ETC.)
 3. REAL ESTATE NON-INDUSTRIAL BUSINESS INVESTMENT (RETAIL, SALES, SERVICE INDUSTRY, ETC.)
 4. SPORT/RECREATION CLUB OR ASSOCIATION
 5. PUBLIC UTILITY
 6. OTHER (PLEASE SPECIFY) _____

6. Have trees been harvested from your land, either by you personally or by someone else, during the time you have owned your forestland?

NO----- → If NO, please go to **Question #8**

YES-----→ If YES, Year of the most recent harvest _____ (continue to Question #7)

7. If you have harvested, what products were harvested? (**Circle all that apply.**)

1. FUELWOOD FOR YOUR OWN USE OR FOR THE USE OF FRIENDS
2. OTHER PRODUCTS FOR PERSONAL USE (FENCE POSTS, LUMBER, ETC.)
3. FUELWOOD FOR SALE
4. SAWLOGS FOR SALE
5. CHIP-N-SAW FOR SALE
6. PULPWOOD FOR SALE
7. CHIPS FOR SALE
8. POSTS, POLES, AND PILINGS FOR SALE
9. CHRISTMAS TREES FOR SALE
10. OTHER PRODUCTS (PLEASE SPECIFY)
11. DON'T KNOW WHAT PRODUCTS WERE HARVESTED

8. Do you plan to cut or harvest trees from your land for your personal use or for sale?

	Wood for own use (Check ONE box in this column)	Wood for sale (Check ONE box in this column)
Definitely in the next 10 years.		
Possibly at some future date.		
Never plan to harvest.		

9. Is there a written forestry or wildlife management plan for your property?

1. YES
2. NO

If yes, who prepared the plan? (Please circle the correct response)

1. I PREPARED THE PLAN
2. OTHER, PLEASE SPECIFY

10. Have you ever sought advice or assistance in managing your forestland?

1. YES
2. NO

11. Why do you own forestland? (Please rank the **Top 3** with number **1=most important; 2=second most important; 3=third most important**)

Rank

- ___ Land investment (hope to sell all or most of my forestland at a profit)
- ___ Recreation (hunting, camping, fishing, bird watching, etc.)
- ___ Timber production (growing timber or other forest products for sale)
- ___ So that I can enjoy the privacy that forestland offers
- ___ Farm or domestic use (having the woods as a source of timber for my own use, (e.g., firewood, fence posts, etc.)
- ___ Enjoyment of owning "green space"
- ___ Part of the farm
- ___ Forestland is part of my residence
- ___ For an estate to pass on to my children
- ___ Other (please specify)

Section II. Certification Issues

Forest certification means that the forests from which the wood comes are managed in a sustainable manner and that the trees are harvested in an environmentally sound manner. Please refer to the enclosed information.

- For the statements below, please indicate your level of agreement or disagreement with the following statements by circling the single most appropriate number after each statement.

I believe there is a need for some form of forest certification of timber management and harvesting of:

	strongly disagree		neither disagree nor agree		strongly agree
US public forests (National Forests)	1	2	3	4	5
State Forests	1	2	3	4	5
US non-industrial private forests	1	2	3	4	5
Tropical forests	1	2	3	4	5
US industrial private forests	1	2	3	4	5

I believe that forest certification can help sustain the health of:

	strongly disagree		neither disagree nor agree		strongly agree
US public forests (National Forests)	1	2	3	4	5
State Forests	1	2	3	4	5
US non-industrial private forests	1	2	3	4	5
Tropical forests	1	2	3	4	5
US industrial private forests	1	2	3	4	5

The motivation for forest certification in the United States is primarily due to:

	strongly disagree		neither disagree nor agree		strongly agree
Consumer demand	1	2	3	4	5
Certification consultants	1	2	3	4	5
Forestry organizations	1	2	3	4	5
Federal Government	1	2	3	4	5
State Governments	1	2	3	4	5
The certifiers themselves	1	2	3	4	5
Environmental organizations	1	2	3	4	5
Industry purchasing requirements	1	2	3	4	5

2. For the statements below, please indicate your level of agreement or disagreement with the following statements by circling the single most appropriate number after each statement.

	strongly disagree		neither disagree nor agree		strongly agree
I understand the concept of forest certification.	1	2	3	4	5
I believe forest certification can reduce tropical deforestation.	1	2	3	4	5
I trust environmental claims made by wood product suppliers.	1	2	3	4	5
I believe forest certification can improve the forestry profession in the United States.	1	2	3	4	5
I believe consumers will pay a premium for certified wood products.	1	2	3	4	5
I have adopted forest “sustainability” practices on my forestland.	1	2	3	4	5

3. For each statement below, please indicate your level of agreement or disagreement regarding forest certification by circling the single most appropriate number.

	strongly disagree		neither disagree nor agree		strongly agree
I believe U.S. forestry laws make certification unnecessary.	1	2	3	4	5
I believe forestry laws in my state make certification unnecessary.	1	2	3	4	5
<i>At this point in time</i> , forest certification is an unworkable concept.	1	2	3	4	5
Forest certification adds an unnecessary level of regulation on private lands.	1	2	3	4	5

4. From the list below, please indicate your level of trust regarding each listed entity to implement and monitor forestry and forest products certification.

	I trust this entity The LEAST			I trust this entity The MOST	
A non-government environmental organization (i.e. Sierra Club)	1	2	3	4	5
The Federal Government (i.e. US Forest Service)	1	2	3	4	5
State Government (i.e. Forestry Department/Commission)	1	2	3	4	5
A wood products industry association (i.e. American Forest & Paper Association)	1	2	3	4	5
A private <u>for profit</u> certification company ¹ (i.e. Scientific Certification Systems)		2	3	4	5
A <u>non-profit</u> certification group (i.e. Smartwood/Rainforest Alliance)	1	2	3	4	5
An approved professional forester by a certification organization	1	2	3	4	5
International Standards Organization (i.e. ISO 14000)	1	2	3	4	5
Individual wood products company that would certify their own company	1	2	3	4	5
Private Landowner Organization (i.e. Tree Farm Program)	1	2	3	4	5

5. Are you willing to allow certifiers to freely check your forestry operations?

1. YES 2. NO 3. MAYBE

6. How much per acre are you personally willing to pay for the costs of certification on your land?
(Please circle one choice)

1. I AM NOT WILLING TO PAY ANYTHING FOR CERTIFICATION
2. \$0.50-\$1.00/ACRE
3. \$1.01-\$2.00/ACRE
4. \$2.01-\$3.00/ACRE
5. \$3.01-\$4.00/ACRE
6. \$4.01-\$5.00/ACRE
7. MORE THAN \$5/ACRE

5. For the statements below, please indicate your level of agreement or disagreement by circling the single most appropriate number after each statement.

	strongly disagree		neither disagree nor agree		strongly agree
Landowners have been adequately involved in the certification discussion	1	2	3	4	5
The professional forestry community has been adequately involved in the certification discussion.	1	2	3	4	5
Certification programs can provide a vehicle for the forest industry to communicate positive accomplishments to the public.	1	2	3	4	5
Consumers are confused by the number of certification organizations that exist.	1	2	3	4	5
Certification is a potentially viable mechanism to aid in promoting sustainable forestry in the U.S.	1	2	3	4	5
Certification could reduce the need for additional forest management regulation.	1	2	3	4	5
The U.S. forestry community should be involved in the certification issue	1	2	3	4	5
I question the willingness of the public to support certification.	1	2	3	4	5

9. Do you believe there to be viable alternatives to outside interests certifying forest management practices (i.e. independent certifiers such as Sustainable Forestry Initiative – SFI, SmartWood, Forest Stewardship Council-FSC) certification of forest management and harvesting? Is so, please list below.

Section III. Please Tell Us More About Yourself
--

Remember, your responses are completely anonymous. If you feel uncomfortable answering questions in this section, please complete the rest of the survey and return it. Thank you.

1. What is your age? (Circle one response)

- | | |
|-------------|----------------|
| 1. Under 25 | 4. 45-54 |
| 2. 25-34 | 5. 55-64 |
| 3. 35-44 | 6. 65 and over |

2. What is your primary occupation?

3. Are you a resident or non-resident forestland owner in Louisiana/Mississippi?

- | | |
|-------------|-----------------|
| 1. RESIDENT | 2. NON-RESIDENT |
|-------------|-----------------|

4. How long have you owned forestland in Louisiana/Mississippi? _____ YEARS

5. What is your best estimate of the total combined income of all members of the owner's household over 14 years of age during the past 12 months? (Please include NET income from businesses, farming, and rentals, money from jobs, pensions, dividends, interest, social security, unemployment, welfare, and workman's compensation.) (Circle one response)

- | | |
|-------------------------|-------------------------|
| 1. LESS THAN \$10,000 | 6. \$50,000 TO \$59,999 |
| 2. \$10,000 TO \$19,999 | 7. \$60,000 TO \$74,999 |
| 3. \$20,000 TO \$29,999 | 8. \$75,000 TO \$99,999 |
| 4. \$30,000 TO \$39,999 | 9. OVER \$100,000 |
| 5. \$40,000 TO \$49,999 | |

6. Your gender: _____ Female _____ Male

7. Your marital status:

- _____ never married
_____ divorced or separated
_____ widowed or widower
_____ married or living with partner

8. What is your level of education? (Please check highest level reached)

- _____ Some high school or less
_____ High school graduate
_____ Some college
_____ College graduate (B.A./B.S.)
_____ Graduate degree (M.S./Ph.D.)

9. Are you a member of any organization with a primary mission to manage forests?

- _____ Yes (*please specify*) _____
_____ No.

APPENDIX B

HOME CENTER RETAILERS SURVEY

Section I. General Company Information

1. Please estimate total gross sales for your company in 2004. (Please circle the appropriate response).

- | | |
|--------------------------------|--------------------------------|
| 1. \$0 - \$5 million | 6. \$101 million-\$250 million |
| 2. \$6- \$10 million | 7. \$251 million-\$500 million |
| 3. \$11 million - \$25 million | 8. \$501 million-\$1 Billion |
| 4. \$26 million-\$50 million | 9. More than \$1 Billion |
| 5. \$51 million-\$100 million | |

2. Please estimate the total number of people that are currently employed by your company in **ALL** company locations. (Please circle the appropriate response).

1. 1-10 EMPLOYEES
2. 11-25 EMPLOYEES
3. 26-50 EMPLOYEES
4. 51-100 EMPLOYEES
5. 101-500 EMPLOYEES
6. MORE THAN 500 EMPLOYEES

3. In what state is your company headquarters located? _____

Section II. Wood Products

1. Does your company sell wood products? (Please circle the appropriate response).

1. YES 2. NO

2. If **NO**, would you be interested in selling wood products in the future? (Please circle the appropriate response).

1. YES 2. NO 3. I DO NOT KNOW

If you answered “NO” to Question 1 in this Section II (your business <u>does not currently SELL</u> wood products please return this questionnaire in the postage-paid envelope provided.
--

If you answered “YES” to Question 1 in this Section II (your business <u>does</u> SELL wood products), please continue with the questionnaire on Page 2.

3. Please indicate the wood products your company (Please check ☒ all that apply)

☐ Cabinets
☐ Doors
☐ Flooring
☐ Furniture
☐ Hardwood lumber
☐ Hardwood plywood
☐ Laminated Veneer Lumber (LVL)
☐ Medium Density Fiberboard (MDF)
☐ Molding & Millwork
☐ Oriented Strandboard (OSB)

☐ Pallets
☐ Panel Products
☐ Particleboard
☐ Shelving
☐ Softwood lumber
☐ Softwood plywood
☐ Treated Wood Products
☐ Veneer
☐ Windows

4. Please **estimate** the percent of your company's TOTAL 2004 gross sales that was from wood products. (Please circle the appropriate response).

- | | |
|------------|--------------|
| 1. 1%-9% | 6. 50%-59% |
| 2. 10%-19% | 7. 60%-69% |
| 3. 20%-29% | 8. 70%-79% |
| 4. 30%-39% | 9. 80%-89% |
| 5. 40%-49% | 10. 90%-100% |

5. Where does your company purchase its wood products? (Please circle all that apply).

1. FROM U.S. BROKER/WHOLESALE
2. FROM INTERNATIONAL (FOREIGN) BROKER/WHOLESALE
3. DIRECTLY FROM INTERNATIONAL PRODUCERS
4. MY COMPANY AGENTS
5. **OTHER**

A. (PLEASE SPECIFY) _____

6. From which region(s) do the wood products you purchase originate? (Please circle all that apply).

1. NORTH AMERICA
2. SOUTH AMERICA
3. CENTRAL AMERICA
4. AFRICA
5. ASIA
6. EUROPE
7. OCEANIA
8. **OTHER**(PLEASE SPECIFY) _____
9. I DON'T KNOW

7. Please rate the relative levels of importance for criteria your company uses in selecting wood product suppliers (Please indicate level of importance for each criterion).

	Not important At all	Somewhat important	Very important
Company reputation	1	2	3
Fair prices	1	2	3
Product quality	1	2	3
Product availability	1	2	3
Knowledgeable sales people	1	2	3
Fast response to our inquiries	1	2	3
High level of overall customer service	1	2	3
Consistent delivery	1	2	3
Helps us gain access to markets	1	2	3
Distribution capabilities	1	2	3
Marketing skills	1	2	3
Computer technology capabilities	1	2	3
Potential for long-term relationship	1	2	3
Uses the Internet	1	2	3
Can communicate through email	1	2	3
Source of the products that they sell us	1	2	3
Certification/Eco-labeling	1	2	3
Wood is kiln-dried	1	2	3
Uses ALS (U.S.) grading standards	1	2	3
Representatives speak English	1	2	3
Product design	1	2	3

OTHER: (please specify)

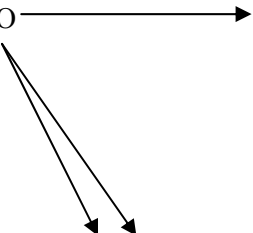
Section III. Certified Wood Products

Generally, certification means that the forests from which wood products come are managed in a sustainable manner and that the trees are harvested in an environmentally sound manner. Such wood is said to be certified. Forest management and harvesting are monitored by an entity that “certifies” the company managing forests or producing wood products. Companies who purchase certified wood, manufacture it into a product, and sell a certified finished product often obtain a chain-of-custody certification. The chain of custody certification helps insure that certified wood was used in the product.

Your Company’s Certified Product Purchases

1. Does your business sell **certified** wood products? (Please circle the appropriate response).

1. YES

2. NO  If you answered “NO”, Do you plan to sell certified wood products in the future?

1. YES

2. NO

If you answered “NO” (your business does not sell certified wood products) please place the survey in the enclosed POSTAGE PAID envelope and mail back to us.

If you answered “YES” (your business does sell certified wood products), please continue to the next Question 2 below.

2. Does your company have a chain-of-custody certification for the certified wood products you purchase? (Please circle the appropriate response).

1. YES, WE ARE CERTIFIED BY _____

2. NO

3. I DO NOT KNOW

3. Approximately what percent of your company’s total wood product sales (by value) are certified?

____%

4. Which certification scheme(s) does your company accept? (Please circle all that apply)

1. FSC

2. SFI

3. TREE FARM

4. GREEN TAG

5. PEFC

6. ISO 14000

7. **OTHER** (PLEASE SPECIFY) _____

5. Which certification scheme(s) does your company prefer? (Please circle all that apply)

1. FSC
2. SFI
3. TREE FARM
4. GREEN TAG
5. PEFC
6. ISO 14000

i. **OTHER** (PLEASE SPECIFY) _____

6. On average, how much more does your company pay for certified wood products than for comparable non-certified wood products? (Please circle the appropriate response).

1. WE DO NOT PAY MORE FOR CERTIFIED WOOD PRODUCTS
2. 1 - 5 % MORE
3. 6 - 10 % MORE
4. 11- 15 % MORE
5. 16 - 20 % MORE
6. OVER 20 % MORE

7. Has your company ever requested that your non-certified wood suppliers become certified? (Please circle the appropriate response).

1. YES
2. NO

Your Company's Certified Product Sales

1. What is the approximate value of **certified wood products** sold by your company in 2004?

\$ _____

2. How did the percent of sales of certified wood products sold by your company change in the past 5 years? (Please circle the appropriate response).

1. DECREASED DRAMATICALLY
2. DECREASED SOMEWHAT
3. REMAINED THE SAME
4. INCREASED SOMEWHAT
5. INCREASED DRAMATICALLY

3. How do you perceive the percent of sales of certified wood products sold by your company to change in the next 5 years? (Please circle the appropriate response).

1. DECREASE DRAMATICALLY
2. DECREASE SOMEWHAT
3. REMAIN THE SAME
4. INCREASE SOMEWHAT
5. INCREASE DRAMATICALLY

4. Does your company actively promote its products as certified to customers?

1. YES 2. NO 3. I DO NOT KNOW

5. Does your company's certified products carry an "Eco-Label" indicating that they are certified?

1. YES 2. NO 3. I DO NOT KNOW

6. Why did your company enter into the certified wood product market? (Please circle all reason(s) that apply).

1. WAS THE ONLY PRODUCT AVAILABLE
2. PRESSURE FROM ENVIRONMENTALISTS
3. SEEKING TO INCREASE SALES VOLUME
4. SEEKING TO DIVERSIFY PRODUCTS
5. SEEKING TO EXPAND MARKET SHARE
6. SEEKING TO INCREASE PROFIT PER UNIT
7. BUSINESS OWNER'S COMMITMENT TO ENVIRONMENTAL ISSUES
8. IMPROVE COMPANY IMAGE
9. REDUCE BUSINESS RISK FROM NOT CARRYING THE PRODUCT
10. OUR COMPETITION WAS SELLING CERTIFIED PRODUCTS
11. OUR CUSTOMERS DEMANDED IT

A. **OTHER** _____

7. Has your company experienced any unexpected benefits due to participating in certification?

1. NO
2. YES

8. Has your company experienced any unexpected costs due to certification?

1. NO
2. YES

VITA

Polwattage Kushil Priyan Perera was born in 1977 in Colombo, Sri Lanka. After successfully completing the General Certificate of Education Advanced Level examination (GCE A/L), he was selected to follow Forestry and Environmental Science Special Degree at the University of Sri Jayewardenepura, Sri Lanka. For his undergraduate thesis, Priyan investigated some wood properties of three plantation timber species in Sri Lanka. He received the Bachelor of Science Forestry and Environmental Science degree on August 2004 with First Class honors. In the Fall of 2005 he enrolled at Louisiana State University (LSU) to pursue a master's degree in forestry, concentrating on forest products marketing under Dr. Richard P. Vlosky. While progressing towards the completion of his master's degree in forestry, Priyan joined the Department of Environmental Studies at LSU to pursue another master's degree (non-thesis) in environmental sciences. His Master of Science (forestry) degree has a strong specialization on forest certification.